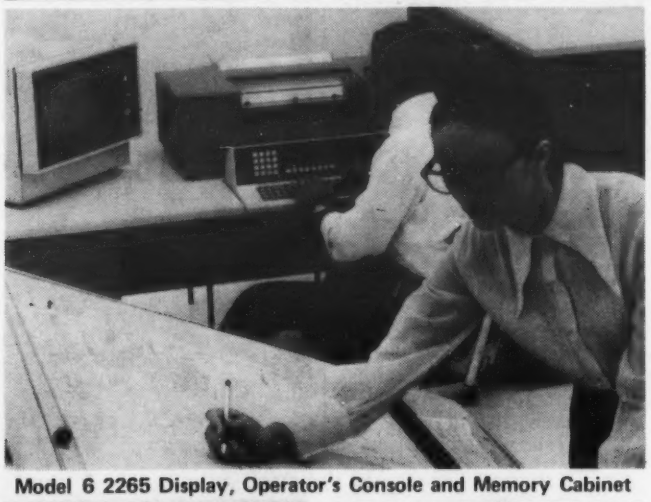
COMPUTERWORLD

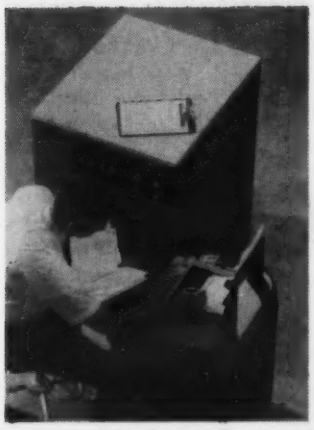
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper – Second-class postage paid at Chicago, Illinois

Vol. IV No. 44 | November 4, 1970 | Price: $9/year



Model 6 2265 Display, Operator's Console and Memory Cabinet



IBM System/7

Model 6 Ledger Card Unit

Keyboard Oriented

System/3 Model 6 Includes Disk, Ledger Card, Basic Language

By Frank Piasta
CW Staff Writer

WHITE PLAINS, N.Y. – The newest version of the IBM System/3, the Model 6, is designed to appeal to a variety of users:

- The business-oriented user who has been doing his data processing on bookkeeping machines and desk calculators.
- The scientific-oriented problem solvers, such as engineers and scientists, who can use the system to perform computations that would not justify a larger machine.
- The large computer installation that needs programmable terminals that can tolerate the restricted I/O facilities of the Model 6.

Priced at about $1,000/mo for a typical configuration, the small system will be available for first deliveries in "less than 60 days," IBM said.

Restricted Card Handling

One group that will not find its requirements met are the card-oriented users. The restricted card handling capability of the new system will force these users to look to the original System/3, now called the Model 10, to fulfill their needs.

Card handling equipment is limited to the System/3 Data Recorder, which can read, punch and print 96-column cards at 22 card/min, on-line as an optional feature.

IBM has joined GE, Burroughs, Honeywell, and others in supplying a keyboard-oriented computer with disk capability.

The system can process ledger cards similar to those used in bookkeeping machine applications, using the serial printer as its principal output device.

The software packages supplied with the Model 6, RPG II and Basic compilers, are used in conjunction with the keyboard to achieve an interactive mode of operation, with the operator keying in the data. Fortran, IBM said, will not be available.

A typical System/3 Model 6 keyboard entry configuration would consist of a central processing unit with an 8K byte main memory, a 2.45 million character disk file and an 85-char/sec serial printer.

Core capacities can range from 8K to 16K bytes. Memory cycle time is 1.52 μsec. Add time is 26 μsec for two 5-digit numbers.

The primary method of entering information into the Model 6 is the console keyboard, an integral part of the CPU. The keyboard is similar to that of a typewriter. A standard 10-key adding machine cluster is used for numerical data entry.

Model 6 Peripherals

Printers available with System/3 Model 6 include three 13-in.-wide models (132-print positions) available for conventional printing and two 22-in.-wide models (220-print posi-

(Continued on Page 4)

IBM Adds Small Process Control Unit, System/7

WHITE PLAINS, N.Y. – System/7, a low-cost process control computer announced by IBM, provides sensor-based data processing related to either relay or solid-state multiplexer points. The company said the smallest configuration of the System/7 would rent for $352/mo or sell for $16,000.

The system can be used as part of a network or as a stand-alone unit. The type and number of sensing points is determined by the configuration of input-output modules attached to the central processor, IBM said.

The system's all-monolithic memory can be expanded at the user's site, IBM said.

A "host" computer attachment allows System/7 to operate with an IBM 1130, 1800, System/370 or models 25 and up of the System/360 for additional I/O and computational capability.

(Continued on Page 4)

One Third of Hospitals Reported Dissatisfied With Vendor Support

By Michael Merritt
CW Staff Writer

CHICAGO – Based on responses from 40% of the hospitals in the U.S., a survey has discovered that over a third of hospital computer users rate the support they receive from their vendor as less than good.

Among the larger hospitals almost half expressed various degrees of dissatisfaction with vendor support.

Conducted for the Hospital Financial Management Association, the survey, "The State of Information Processing in the Health Care Industry," was compiled by Harris, Kerr, Chervenak, and Co.

The survey is based on questionnaire and interview responses from 2,800 of the 7,137 members of the American Hospital Association in the 48 contiguous states.

The survey revealed many hospitals where costs were clearly out of proportion to results and suggested: "Too often the hospital seems to have wandered into data processing with insufficient expertise; without first defining its requirements fully and realistically, and without establishing its short- and long-range objectives."

Of the respondents, 503 had installed computers, 75 had computers on order, and 1,106 used an outside computer service.

Call for Integrated Software

About two-thirds of the users have made at least limited use of application packages and are largely satisfied with them. The most frequently voiced complaint, however, was that no vendor provides a comprehensive set of application packages which covers the broad spectrum of hospital information needs in an integrated manner.

None of the computer manufacturers has provided such packages to cover all – or even most – of the major hospital reporting areas. All of them con-

(Continued on Page 4)

On the Inside

Univac 494 Serves 25 State Divisions — *Page 16*

Telex 5403 Printer Is 1403-Compatible — *Page 23*

Communications 22
Computer Industry 31
Editorials 8
Education 27
Financial 33
Societies 25
Software/Services 17
Systems/Peripherals ...23

Hearings to Probe Status

Are Programmers Professionals?

By Edward J. Bride
CW Staff Writer

WASHINGTON, D.C. – Computer programmers who insist they should be considered "professionals" will have their day in court soon, when the Labor Department opens two-pronged hearings to define the term "professional."

An offspring of achieving such official status would be a programmer's exemption from minimum wage and overtime pay laws, according to reports from the Labor Department and from the Association of Data Processing Service Organizations (Adapso).

Jerome L. Dreyer, executive vice-president of Adapso, announced that his organization would seek to "secure exempt status" from these laws for programmers. He indicated this exemption would be tantamount to the government's recognition of programmers as having professional status.

Dreyer said Adapso's position was that programmers "are at the professional level in our industry," and have been trying to achieve that status "through their various societies like DPMA and ACM."

"I think we would want to upgrade them in that area, too," Dreyer commented.

"Problem Is Inconsistency"

Adapso will appear at the December hearings, according to Dreyer, who emphasized that "the problem is inconsistency. And the crux of the problem is definitions." He claimed the status of programmers, i.e. exempt or non-exempt from wage and overtime regulations, varies from state to state, town to town, and even time to time, depending on the local Labor Department administrator.

A final classification would solve any inconsistencies, he proclaimed.

Dreyer announced Adapso's position in a recent "general information" bulletin to association members. The announcement was applauded in

(Continued on Page 4)

E. RALPH GRAVES, V.P.-SALES

COST-SAVING
ACTION
CONFIDENCE

WE BUY AND SELL

■ PUNCHED CARD EQUIPMENT

■ COMPUTERS ALL MODELS

FOR THE COST-CONSCIOUS DATA PROCESSOR, WE HAVE:

- MILLION-PLUS INVENTORY
- IMMEDIATE DELIVERY
- FLEXIBLE PAYMENT
- PROFESSIONAL PEOPLE
- CASH FOR SURPLUS EQUIPMENT
- BROKERAGE LISTING

We Need:

1403
N1 PRINTER

AVAILABLE NOW

1412 MICR READER/SORTER

●

1401 – 16K TAPE SYSTEM

COMPUTER ACQUISITIONS COMPANY

P.O. Box 29185
Atlanta, Ga. 30329

PHONE (404) 458-4425

DATA COMMUNICATION IDEAS?

TALK TO TALLY

For only a few dollars per month, you can put the Tally System 100 to work gathering data from your multiple remote sites to report to your central computer facility. Speed is 600 wpm. Low price optional extras include automatic error control and unattended operation. Write or call Tally, 8301 South 180th Street, Kent, Washington 98031. Phone: 206-251-5050. TWX: 910-423-0095.

POSTMASTER: CHANGE OF ADDRESS FORM 3579 to be sent to Computerworld Circulation Dept., 797 Washington, Newton, Mass. 02160.

Off-Line Systems in Evidence

Bema Show Attendance Down, Interest Up

By Ronald A. Frank
CW Technical News Editor

NEW YORK – Although attendance was down compared with last year's show, users at the annual Business Equipment Manufacturers (Bema) exposition held at the New York Coliseum last week seemed more intent on evaluating the equipment and products being displayed.

One exhibitor told CW that potential users were asking more penetrating questions concerning performance, cost, and features as opposed to the grab-a-leaflet-and-run approach of previous years.

Among the EDP equipment being shown, off-line systems were well represented along with the more familiar on-line peripherals.

The A.B. Dick Co. introduced a direct image desk-top copier to produce paper copies from CRT displays at a rate of 5 sheet/min. The Model 9750 Display Copier includes a built-in CRT monitor, and can be operated from one or more of a user's existing display terminals.

'Transmitting Typewriters'

Data Instruments Co. showed a new cassette-oriented "transmitting typewriter" which added a remote entry capability to its Dataplex system. A spokesman said the device was a modified Olympia typewriter since this unit had been found more adaptable than the commonly used IBM models.

The firm also introduced a version III of its Formol software which adds I/O control, editing, add, and subtract capabilities to the Dataplex data entry system.

Automated Information Systems demonstrated one of the first production models of the Ultimacc accounting system which uses a Data General Nova CPU. Robert Weber, the firm's president, said the first system had been installed at a user site and a national maintenance support will be provided by Honeywell's field service division.

Among the IBM-compatible disk drives was the BASF Systems Inc. 1014 system which was shown with a compatible controller for the first time. The system is manufactured by Century Data Systems and sold by BASF. The company also demonstrated its new IBM-compatible MTST tape cartridge which a spokesman said is priced considerably lower than the IBM cartridge.

Keypunch Adapter

A new data processing subsidiary of Western Union, Western Union Computer Utilities, demonstrated an adapter to the familiar IBM 029 keypunch which converts the device into a verifier without requiring the user to purchase the usual verify-only unit.

Designated the WUCU/IDT Verifier Adapter, the unit converts from verifier to keypunch operations as required, a spokesman said.

The firm also displayed information concerning its network of service bureaus which is projected to reach 300 by the end of 1972. A company spokesman told CW that 30 of the bureaus are already in operation.

AT&T showed the Teletype Inktronic printer which is being introduced as part of the Bell Dataspeed service. A Bell spokesman said AT&T will file an interstate tariff for the device within "60 to 90 days" at a price of "about $275/mo."

The printer was being demonstrated on-line with a special computer installed at a Bell facility in Omaha. The CPU is a modified Honeywell H 1200 equipped with communications to demonstrate up to 21 remote devices at various AT&T exhibits across the country.

Bottled?

Computer in a bottle? Not quite. Pepsi-Cola Bottlers, Inc. merely superimposed a photo of its System/3.

'Gadfly' Systems Analyst Bugs This State

By Edward J. Bride
CW Staff Writer

OLYMPIA, Wash. – A silent uproar.

That's what an unemployed systems analyst is stirring up, charging the state with massive waste of computer systems, covering up inefficiencies, and discrimination to boot.

The analyst is Frank Majdali, a Palestinian Arab who claims his firing from the State Highway Department was a direct result of his charges that the state is wasting money and computer time by, among other things, running paychecks on a computer.

"They don't do any computing. They just write the figures, have them audited manually, and have them keypunched. They just print the checks with a computer, and actually, a 402 could do this job," he claimed.

A spokesman for the state Division of Data Processing disagreed, claiming the system was an entire payroll and labor distribution package. An official of the State Highway Department added: "Every step in the process is computerized."

Majdali also said there is more waste by using computers for collating. Tasks that used to take two hours on collating equipment now take four hours on the computer, he charged.

Majdali's allegations actually go much deeper, but they are pretty much ignored by state officials in the governor's office, the Highway Department, and the division of data processing.

The State Board Against Discrimination has completed an extensive investigation, however, and plans to release its findings in mid-November. The investigation was mainly aimed at the charges of discrimination, and attempts were *not* made to consider the computer issues, a spokesman for the board said.

Majdali has actually been fired twice, since a procedural technicality voided the first dismissal. State officials said the proper termination procedure was used the second time, and it "will probably stick."

Concurring Investigator?

Majdali's allegations were probed in part by Marvin Honore, a black investigator who claims to have been "shuffled around the state" as part of a "conspiracy to cover this up."

While he would not divulge his findings on the discrimination charges, he did claim the November report would be comprised largely of his input.

Honore also indicated that Majdali's attempts to "save taxpayers a considerable amount of money . . . would be far to the man's credit" had they been successful.

The investigator was first assigned to the Majdali case several months ago, but was transferred to Tacoma after trying to see the governor to inform him of Majdali's charges of waste.

Honore stated he told discrimination board head Alfred Cowles that Majdali's complaint did not cover discrimination, but was "a financial matter. But I thought this had great ramifications for the state," Honore said, and asked permission to see the governor.

Honore said that Cowles agreed, but rescinded the permission ("forgot") when another governor's aide suggested this was a violation of protocol.

Honore's transfer followed shortly, and two reporters for the *Seattle Times* said they had a copy of a Cowles memorandum stating the transfer was a direct result of Honore's attempts to see the governor.

Majdali claimed the Highway Department computer center is overstaffed: "In this case, they are deliberately wasting money. I couldn't put up with this."

He said his discrimination claims were really attempts at creating public concern for the "waste" issue, and were filed at the behest of other state employees who knew of his computer research and documentation.

Majdali went to work for the state about three years ago, admittedly for the sole purpose of setting up a payroll system which, if implemented, could be spread nationwide and would provide a "good recommendation" when he returned to private business.

He joined state ranks at the time that "DP people didn't stay more than six months in any place," but now feels he was "blackballed" by the state's apparent reluctance to accept his systems

No Program

Officials at the State Highway Department said he didn't really have a system, "just some ideas and a sketch. No program outline."

Don Ross, state DP coordinator, also claimed that Majdali's system "would not encompass labor distribution, and my common sense tells me that it couldn't have been done for only $20,000 a year," as Majdali has claimed.

Ross also said he wasn't sure that anybody has considered Majdali's various allegations very seriously. "I don't think people want to give him too much credit by investigating that kind of a statement," said Ross, of Majdali's payroll promise.

Estimates of the current cost of the payroll package for the State Highway Department vary considerably, from Majdali's $1.5 million down to $820,000 in a study conducted two years ago by Price-Waterhouse.

The latter study also suggested that about $500,000 could be cut from the lower estimate, but Majdali considers even the suggested $320,000 excessive for payroll and labor distribution for 5,000 employees.

Majdali said he has documentation for all his charges, and his story reads "like a two-bit novel."

"My documentation would make a second best-seller, like *The Godfather*," the analyst claimed.

"I thought I was doing a good deed for my adopted country," he added, "and I didn't know I could be kicked so fast."

He continued: "My job is secondary, the discrimination is secondary. The issue is inefficiency . . . they are deliberately wasting money."

Majdali is hoping that his documentation will cause public hearings, but Ross doubts this will happen. The DP coordinator said Majdali's contention that he could do a complete payroll system for $20,000 a year is "preposterous," and there's "not that much of a risk" that Majdali is right.

He added: "I don't feel it's that much of an issue. But if it becomes a serious problem in the minds of the public . . . I suppose that the state would be forced to go back and waste some of the taxpayers' money in defending its position."

This is the kind of "waste" Majdali would like to see.

"Imagine me running a line printer."

Wanda Mackey, Boston Model

"I get calls from all kinds of kooks.

"So I wasn't surprised last Spring when a man called and asked me to go with him to something in Atlantic City called the 'Spring Joint' to demonstrate some machine he said was a 'mini line printer'.

"'Don't worry, we can teach you how to run it,' he told me. 'It's made especially for the mini computer OEM, but with the end user in mind.'

"It turned out he wasn't kidding.

"Anyway, I arrived in Atlantic City, scared to death. Me, who can't run a sewing machine, I'm going to demonstrate something I never even *heard* of!

"So you can imagine my surprise when, in just one morning, I learned how to operate Nortec's Mini Line Printer.

"For me, that's like a miracle."

Nortec's mini line printer.

The Nortec 200 is a 132-column printer that prints the crispest 6-part copies in the business, at the rate of 200 lines per minute with a 64-character font. Its yoke assembly opens to the front, making it easy to load forms and change ribbons. Its 8-channel vertical format unit is as easy to program as an electric typewriter. It's also about the size of an electric typewriter. It interfaces easily with any computer, and takes 6-part forms in any width up to 14". With complete electronics, including 132-character buffer controller, it's just $6,000 in large OEM quantities. Price is all-inclusive, even with self-test feature for testing electronics and mechanism. Nortec Computer Devices, Inc., a C-T Co., Southboro, Mass. 617-481-2500. (West Coast, 714-835-3626.)

3/6 Appeals to Different Users

(Continued from Page 1)
tions) that accommodate ledger cards.

Model 6 printers use a serial wire matrix printhead with a speed of 85 char/sec. One 13-in. and one 22-in. printer offer bi-directional capability. As one line is completed with the printhead moving from left to right, the next line is printed on the return, right to left.

The 22-in. printers equipped with ledger card device allow a single card to be positioned, posted and stacked in about four seconds.

A Data Recorder can be attached to the Model 6 for batch input of programs and data using the 96-column punched card. It can be used both on-line and off-line. During the on-line use, the data recorder can operate at 22 card/min – reading, punching, or punching and printing.

Ledger cards can be handled in sizes up to 11 in. by 14 in., and can be used on both sides. The ledger card stacker can accommodate up to 100 cards.

An additional output device, an optional IBM 2265 CRT display unit, can be be used to provide interaction with the system and access to stored information.

To provide additional functional flexibility, particularly for small banks, an optional Serial Input/Output Channel (Sioc) is offered for System/3 Model 6. The Sioc allows attachment of input-output units such as the IBM 1255 magnetic character reader.

System/3 Model 6 can be used as a terminal/processor. A Binary Synchronous Communications Adapter (BSCA) is available that allows Model 6 users to exchange data over switched, leased or private lines with remotely located System/3s, and with 360 and 370 models.

A typical System/3 Model 6 will rent for $1,015/mo, or may be purchased for $48,250.

Model / Features	GE 58	H 115	Singer System 10	Burroughs L 4000	IBM Sys./3 Model 10	IBM Sys./3 Model 6
Main Mem. (K Words)	5 to 10 (bytes)	16 to 32 (6-bit)	10 to 110 (bytes)	1,024 (8-byte) (fixed disk)	8 to 32 (bytes)	8 to 16 (bytes)
Cycle Time (μsec)	1.2	2.75	3.3	5 msec (av. access time)	1.52	1.52
Auxiliary Random Access Storage (millions)	11.5 (bytes)	36.8 (char)	10 to 100 (char) (bytes)	No	2.5 to 9.8 (bytes)	2 to 9.8 (bytes)
Ledger Card Handling	No	No	Yes	Yes	No	Yes
Languages	Gesal, Gecol	Easy-coder, Cobol, Fortran	Assembler, Fortran, Simulator	Cobol (sub-set), Assembler	RPG II	RPG II Basic
Rental ($K)	0.9 to 2.2	1.9 to 6.8	1.4 to 6.5	0.4 to 0.6	0.9 to 4.0	0.9 to 2.7
First Delivery	10/70	6/70	9/70	7/70	1/70	12/70

Chart compares new System/3 Model 6 with other small business computers.

Basic as Well as RPG II Offered With Model 6

By Don Leavitt
CW Staff Writer

WHITE PLAINS, N.Y. – The Model 6 user has a choice of programming languages. RPG II is available for commercial data processing and Basic can be used for problem-solving.

The user is not faced with an "either/or" choice: both language processors can reside on the same disk cartridge.

RPG II, the only language that was available on the earlier S/3, Model 10, has been modified to make use of the hardware capabilities of the Model 6.

The Basic compiler includes software paging techniques which allow the Model 6 to operate as if it had 64K bytes in its main memory.

According to IBM, this paging allows programs containing up to 990 statements to run on a Model 6 with only 8K bytes of main memory.

Model 10 Batch-Oriented

The S/3 Basic, accessible to only one user at a time, is a version of Call/360 Basic. Basic for the Model 6 is not adaptable to the Model 10, since that is essentially a batch-oriented machine, IBM noted.

RPG II handles the new I/O features, including ledger card processing and the display station output.

The Basic compiler will be licensed at $110/mo, available with first customer shipments in December. The RPG II compiler for the Model 6 will be licensed at $35/mo, and will be available in March 1971.

Process Control Unit Added to IBM Line

(Continued from Page 1)
IBM System/7 includes a 16-bit processor module, I/O modules, and an operator station. The processor module and from one to 11 input-output modules are housed in enclosures that also provide internal power and signal distribution.

The processor module features 2,048 to 16,384 words of monolithic storage in 2,048-word increments.

Although the System/7 has a 400 nsec cycle time and its input modules can scan 128 relay or solid-state multiplexer points, it is limited to four priority interrupt levels.

By contrast, IBM's 1800 process control system has 12 levels of interrupt but operates, depending on the model, at speeds of only 2 μsec or 4 μsec.

There are two types of input-output modules available with System/7, the IBM 5014 analog input module and the 5012 multifunction module. In each, the external sensor wiring connects by plug-in termination cards.

The operator station consists of a typewriter-like keyboard and request key, printer, paper tape reader, and paper tape punch. Operation is under program control. Switches permit the system to be used as a source program preparation device, the company said.

Programming for users who do not have access to a host computer is accomplished through the IBM System/7 Assembler.

The IBM 2790 data communication system devices supported by System/7 include the 2791 and 2793 area stations, 2795 and 2796 data entry units, 1053 printers and 1035 badge readers.

Monthly rental is $352 for the smallest IBM System/7, including the processor, 2,048 words of monolithic memory and one I/O module. The purchase price is $16,060. Additional memory increments of 2,048 words rent for $105.

The required IBM 5028 operator station is available, purchase only, at $2,240.

Labor Hearings May Clarify Status of Programmers

(Continued from Page 1)
some quarters, although one programmer insisted he "never got the compensatory time off" which was supposed to be awarded in lieu of overtime pay for himself, as is the case with other per annum workers.

Adapso's position will be presented by Dr. H.W. Robinson, a vice-president and executive consultant of Control Data Corp., which operates the Cybernet time-sharing network.

The Fair Labor Standards Act of 1938 provides wage and overtime exemptions for personnel employed in executive, administrative, or professional capacities.

A Labor Department spokesman indicated the hearings would be conducted so that industry could better classify certain jobs which had been created since the law went into effect.

In announcing the hearings, the *Federal Register* noted programmers perform "a variety of tasks which are difficult to measure in terms of their significance and importance to management."

The *Register* also noted consideration was being given to including as "professionals" persons with "highly paid occupations" not in a field of science or learning, or which are "learned primarily through extensive experience and on-the-job training."

Interested parties were invited to file written data and views with the Administrator, Wage and Hour Division, Department of Labor, 14th St. and Constitution Ave. N.W., Washington, D.C. 20210.

The spokesman for the Department of Labor stated the deadline has passed for filing "intentions to appear," but that a limited number of late requests might be honored.

Survey Also Hits Hospital DP Planning

(Continued from Page 1)
centrate on a few major applications, the report said.

Only half of the computer installations report employing any systems analysts, according to the survey. And although 51% of the respondents reported spending less than $1 per patient day on data processing, some hospitals reported spending more than $8 per patient day.

When asked what their most troublesome areas in data processing were, the respondents led off with integrating EDP into the hospital environment, mentioning it 45% of the time.

Next were training, 30%; program development, 30%; personnel, 28%; and scheduling, 21%.

About 60% stated that actual performance had been as expected, while 25% said it was less than expected, and only 14.5% considered it to be better than expected.

In terms of the actual cost of EDP, 58% reported that costs are in line with expectations, 5% say they are less than expected, and 36% say they are spending more on EDP than they had planned.

There are two or less computer operators at 52% of the hospitals, and 36% have three or four. Sixty-three percent of the hospitals have two or less programmers, while 38% have two or less keypunch operators.

Of the hospitals using outside services – 42% for one or more applications – the majority use banks and commercial service bureaus, rather than service bureaus offering specialized service to health care institutions.

Twenty-nine percent of the respondents indicated that they would be reluctant or unwilling to share a computer facility. The smallest hospitals most frequently consider sharing unacceptable, the report revealed.

While minicomputers are frequently discussed, actual installations have been limited to a few special-purpose applications.

Long Way to Go

The report indicated that more than 55% of all hospital information processing applications are still performed by hand. The only areas in which EDP is gaining broad acceptance are in the payroll portion of personnel management, accounts receivable, and patient accounting. Applications peculiar to hospital use are still not widespread.

Of the hospitals with computers, 88% still use keypunches for part or all of their data input. Paper tape is used in 24% of the installations, keytape in 17%, and other devices in 14%.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
TM Reg. U.S. Pat. Off.

ROBERT M. PATTERSON, *executive editor.* V.J. FARMER, *news editor.* RONALD A. FRANK, *technical news editor.* EDWARD BRIDE, LESLIE FLANAGAN, JOSEPH HANLON, DONALD LEAVITT, MICHAEL MERRITT, ANNE NOLAN, FRANK PIASTA, *staff writers.* CHRISTINE FREDERICKSON, *librarian.* MARVIN ARONSON, MARY UPTON, *copy editors.*

E. DRAKE LUNDELL JR., *computer industry editor.*

ALAN DRATTELL, *Washington bureau;* PHYLLIS HUGGINS, *Los Angeles bureau;* THOMAS J. MORTON, *Chicago bureau;* J.H. BONNETT, *European bureau.*

NEAL WILDER, *national sales manager;* DOROTHY TRAVIS, *sales administrator;* FRANCES SHIMANSKY, *market research.*

LEETE DOTY, *assistant publication manager;* RONALD H. SUMNER, *production supervisor;* HENRY FLING, *art services supervisor;* MARSHA BRENNER, *advertising copy co-ordinator;* W. CRAIG WALKER, *director of creative services.*

EDITORIAL OFFICES: 797 Washington St., Newton, Mass. 02160 (617-332-5606; TWX 710-335-6635). Chicago: 25 E. Chestnut St. 60611 (312-944-5885; TWX 910-221-1377). Los Angeles: 11661 San Vincente 90049 (213-826-6655; TWX 910-342-7550). Washington: 2021 L St. NW 20036 (202-466-2630; TWX 710-822-0014). Europe: Computerworld, c/o IDC Europa Ltd., 59 Grays Inn Rd., London, W.C.1, England (01-242-8908).

Second-class postage paid at Chicago, Ill. Published weekly (except: a single combined issue for the last week in December and first week in January) by Computerworld, Inc., 25 E. Chestnut St., Chicago, Ill. 60611. © 1970 by Computerworld, Inc.

Reproduction of material appearing in *Computerworld* is strictly forbidden without written permission. Send all requests to publication manager.

25 cents a copy; $9 a year, $16 two years, $20 three years in U.S. Add $1 per year for Canada; $4.50 per year for foreign. Foreign air mail rates available on request. MARGARET PHELAN, *circulation manager.* Four weeks' notice required for change of address. Address all subscription correspondence to circulation manager, Computerworld, 797 Washington St., Newton, Mass. 02160.

W. WALTER BOYD, *publication manager.* PATRICK J. McGOVERN, *publisher.*

ABP BPA

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Mass. 02160.

A little dropout... is like being a little pregnant.

There's no such thing.

On a read pass, a "little" dropout can cause ten retries. Or abort the job. And on write passes, it may waste up to nine inches of tape.

What's your million-dollar memory doing in the meantime? Waiting . . . expectantly.

In this business, one missing bit can ruin a reputation. That's why there's no such thing as a "little" dropout.

Handling damage causes most dropouts. But now Graham Magnetics has a tape tough enough to resist this kind of damage. *A tape 80 times tougher than anything the competition has to offer.*

EPOCH 4
permanent magnetic tape

We named our new baby Epoch 4. And started it out in life with a 20-year warranty. Because it's really that good.

Look around. Is one of your transports in a retry cycle right now? Or erasing when it could be writing?

You could be a "little" bit pregnant, and not even know it. Maybe you'd better make an appointment with the man from Graham Magnetics.

GRAHAM MAGNETICS INCORPORATED
Graham, Texas 76046 WATS Phone 800-433-2701 Texas Phone 817-549-3211

POSSIBLE *ONLY* AT EPG

NEW YORK'S LARGEST,
FASTEST GROWING
COMPUTER UTILITY

IBM 360/65

$125 per hour

ANYTIME **day or night, 7 days a week.**
Per 100K region.
No charge for spooled printing, card reading and punching.

CONFIGURATION **IBM 360/65 1000K**

4 2314 Direct Access Storage Devices
16 2401M5 9 Track Tape Drives, Dual Density
8 2420 9 Track Tape Drives
6 2401M2 7 Track Tape Drives
4 2311 Disk Drives
5 1403N1 High Speed Printers
3 2540 Card/Read/Punches
1 2501 Card Reader
1 2701 Communications Controller

OS MVT – HASP – RJE

- Convenient Location
- Free Systems Programming Support
- Excellent Turnaround Time
- Free Operators
- In-House Back Up Facilities
- Remote Job Entry
- Free Work Space
- 24 Hour Delivery Service

E.P.G. Computer Services, Inc. **(212) 486-9000 Ext. 900 / Night: (212) 826-0660**

345 Park Avenue (at 51st Street) New York, N.Y. 10022 *Convenient to all NYC transportation / Parking facilities within our building*

35-lb Minicomputer Acts as Front-End To Process Electrocardiogram for Doctor

PHILADELPHIA – A 35-lb Varian minicomputer here is acting as the cost-saving front end for a dual-computer system which processes, analyzes and diagnoses electrocardiograms for physicians.

Called the Automatic EKG Processor, the system was developed by the Boeing Co.'s Computer Services Division, Northeast District, to provide a cardiologist or general practitioner with a computer interpretation of the amplitudes, durations and other pertinent measurements of heart cycle segments in EKGs.

Using the system, the customer – usually a physician – has the option of receiving his EKG results via Teletype or mail, depending upon his requirements.

Besides hospitals and a GP's or heart specialist's office, the system is expected to find wide application in large industry plants, airlines, military dispensaries – any place where regular physical checkups are required and EKGs taken.

The taking of the EKG by the user is by standard procedure, and the technician or nurse attaches electrodes to the patients in the usual manner.

The nurse then dials via touch-tone keyboard a telephone number at the central Boeing facility identifying her origin with two digits and the patient with six.

This links the EKG cart with the digital computer system, via three-channel multiplexing and transmission as a composite analog FM signal over common voice grade telephone lines.

At the Boeing Center, the composite signal is demodulated, yielding the three original EKG data channels. The 620/i, a general-purpose digital computer with an 8K core of 16-bit words, an A/D converter and peripheral digital tape transport, collects each signal from a special Boeing interface. This interface controls system calibrations and band limits the data, minimizing noise effects while still preserving the integrity of the original EKG signal information.

The 620/i then converts from analog to a digital representation and formats on magnetic tape to store the data for further analysis.

Adapso Speaks Out on Privacy

NEW YORK – A major industry organization has called for caution in the use of data banks.

In a position paper the Association of Data Processing Service Organizations (Adapso) has called for a presidential commission to study privacy in a computerized society. Adapso also recommended the commission include "meaningful computer services industry representation."

"Some degree of protection," the paper said," is already afforded by the existing body of law and Adapso feels that hasty governmental restrictive action, no matter how well intended, whether it originates with legislative bodies or at this time, with regulatory agencies, could create additional problems, both technical and human, and retard the benefits which could accrue to society from these technological improvements without affording appreciable additional protection for the privacy of the individual.

"For this reason, Adapso respectfully recommends the prompt creation of a Presidential Commission with meaningful computer services industry representation to study all aspects of the problem of individual privacy in a computerized society.

"Prior to the publication of the recommendations of such a commission and their implementation, Adapso further recommends that industry participants institute meaningful self-regulation.

Prosecutor Probes Budget Irregularities In County DP Agency

CW Midwest Bureau

PAINESVILLE, Ohio – A meeting has been called by the Lake County Prosecutor with the county data processing board to review a state audit critical of the data processing program.

According to the audit, the DP department was criticized in two areas, the payment of contracts for programming services and inadequate keeping of minutes of the board meeting.

Fred V. Skok, county prosecutor, said the meeting was the usual procedure after a critical state audit.

By law, county auditor John H. Mummey is administrator of the DP department. Mummey's deputy, Louis Vinocur, is auditor representative in the DP department.

No Action Taken

The audit said the report of the meeting's minutes failed to note any action taken on the employment or removal of personnel or the establishment of compensation levels. The audit does not criticize the methods used by Mummey to hire or pay people, however.

County Treasurer D.J. Supanick is on record as being critical of pay raises for DP personnel, especially Vinocur.

The audit also said that a payment of $60,000 to Logics, Inc., a software house, out of the real estate assessment fund, should have been made out of the general fund. Mummey explained that payments were made under an old set of guidelines, since revised.

Wisconsin City Finds Enough Work for System/3

SUPERIOR, Wis. – This small midwestern community claims to be one of the first local governments to install the IBM System/3 and according to Donald J. leBrasseur, finance director, "We feel the computer will help us operate more efficiently and allow us to realistically cope with the ever-increasing paperwork of government."

According to Superior officials, IBM systems engineers, working under a contract with the city, assisted the city in the writing and the testing of programs and in converting from a totally manual system.

Several Tasks

The city now runs a payroll program for its 361 employees, a quarterly billing for sewerage, real estate tax billing, voter registration, inventory of motorized equipment, city purchasing, and a parking violations follow-up program.

GOODBYE COMPATIBILITY! HELLO TOTALTRAN

(The translator that works!)

TOTALTRAN, a development of CPU Management Advisory Corp. is the most complete and efficient translation service in the country today. Our software package enables you to convert your second generation 1401, 1440 and 1460 programs into 100% operational IBM 360 and RCA Spectra 70 Assembler Language programs, with unequaled speed, efficiency and economy.

How Successful has Totaltran Been?

One look at the output of our translator together with the fact that CPU has satisfied over 60 clients in less than one year supports our claim that we are **America's #1 Translation Service.**

Guarantee:

Totaltran's service offers **unparalleled guarantees of performance** — never before offered in the EDP industry.

What is the Cost of Translation?

CPU offers many different options under its service ranging from the raw translated output, usually over 96% translated, to a fully operational third generation program.

The extreme efficiency of Totaltran's translator permits CPU to publish its **fixed fee schedules regardless of the complexity of the programs to be processed.** With our published prices, the client is able to perform his own cost analysis and not be subject to the cost variables of other translation and conversion services.

Who Needs the Totaltran Service?

Virtually every firm that would like to convert to third generation but has been plagued by the tight money situation. In many cases, the cost of Totaltran is less than the cost of keypunching a new program.

Translation is one of the solutions to your conversion problem, and you owe it to yourself to look into Totaltran, **the only translator that really works!**

Take advantage of the **most practical, realistic** and **economical method** of converting 1400 series programs to IBM and RCA third generation.

Call or Write Today !

WE INVITE COMPARISON !

*CPU Management Advisory Corp. is a wholly owned subsidiary of Commercial Programming Unlimited, Inc., a publicly owned company.

CPU

CPU MANAGEMENT ADVISORY CORP.
853 Broadway, New York, N.Y. 10003
Telephone: (212) 777-7722

THE TOTALTRAN SYSTEM

Please send additional information, Brochure and Price Lists to:

NAME _____ TITLE _____

COMPANY NAME _____

ADDRESS _____

PHONE _____ EXTENSION _____

Data processing Consultants to Government and Industry for over 5 years.

Editorial

Trial by Fire

This week punch card voting, at least in Detroit and Los Angeles, will either prove its value or fall mortally wounded, bringing disgrace to the computer community.

If, with the help of the many volunteer and paid computer people taking part, the system passes with flying colors, then at least there will be a chance to improve the system before the next election.

If, despite all the willing hands, the system crashes again, more states probably will follow the lead of Virginia and ban the system. This would be a shame because then it might be years before computers get another chance to play a role in elections.

Let us pray.

'Hey, Fellas'

Letters to the Editor

Reader Adds 'Sadder' Tale To Unemployment Picture

I found your article about "Bob Jones" who was unemployed after 19 years in DP interesting but stale news. Anyone even slightly familiar with the situation here on the West Coast must know several sadder stories than that of your "Bob Jones."

Jones has my deepest sympathy and my sincere good wishes for his job search, but I can't give him much hope. I've been in this business for 12 years. I differ with Jones in that I elected to concentrate on "management" as opposed to technical development and, for the last seven years, I've been an installation manager – including systems, programming, and operations.

My salary level was slightly higher than his and I'm a few years younger than he. I was "dehired" on Dec. 31, 1969, and haven't worked since.

Job openings at my level are not plentiful at any time. Now, they are non-existent. Jobs I am "over-qualified" for, but where I might be considered anyway because someone was getting desperate, are being filled by people who weren't available last year at this time.

It's frustrating, to say the least, that I am not allowed to take a reduction in pay to get a job because the employer feels I'll leave as soon as things get better since I'm obviously worth more.

I'll mail this letter as I'm on my way to an interview this afternoon – for a job as a life insurance trainee.

Name Withheld

Lafayette, Calif.

Better Businessmen Managing DP Would Provide Stability

The article published in your Aug. 26 issue entitled "Why are Programmers Dissatisfied?" by Joan Straub, was most interesting and concerns each of us involved in management in the computer field.

Her analysis of the reasons for the turnover of EDP staffs was accurate and I concur that the solution will come only when this field matures as a profession.

I see this happening on a more rapid scale than she implies and believe that we are in the era of "businessmen" taking over the management of EDP departments. This should create a stabilizing factor because the techniques used in hiring, evaluating, and promoting programmers will be more in line with the other segments of the companies for whom they work.

Exigencies have created the possibility for poor managers to run the EDP department until just recently; however, the next year or two will see the end of the EDP group operating on an unbusinesslike basis.

The EDP managers will either be upgraded, removed, or a facilities management group will take over the function for them.

Another point on which I disagree is the short-range solution she proposes; this is not feasible for most in-house installations. It would work fine for software companies or facilities management groups; however, the consequences of this system operating in a large business organization could be disastrous.

I am certain that it would not be long after this bonus system were implemented for programmers until the engineers, accountants, legal staffs, etc. would find ways to show that their production and degree of stability would be logically increased if they too were provided a royalty system for anything they did for the company.

This would definitely be a short-range solution and I believe would have ultimate consequences which would be disastrous to the programming profession. I reiterate that it is excellent for a computer company, but not for an in-house group; and this is where the majority of the programmers and analysts are employed.

I commend Joan Straub for this thought-provoking article, but we must find solutions that are workable within the corporate structure. Better businessmen managing the EDP function is the only way I see a permanent solution to building a stable, professional staff.

B.R. Huffman
Director of Information Systems

Occidental Petroleum Corp.
Houston, Texas

Computer Automation Is Alive And Well, And Still Growing

Computer Automation has been flooded with calls because of headlines pointing out the financial problems of Computer Applications, Inc. Unfortunately, confusion has resulted from the fact that both Computer Automation, Inc. and Computer Applications, Inc. are sometimes referred to as CAI.

To attempt to set the record straight and head off future confusion, let me state that Computer Automation is in a healthy cash position and operating profitably. Our plans have not changed. We are not leaving the OEM field for the "end user market."

At the Fall Joint Conference, we will show two new versions of our 8- and 16-bit computers plus a new product for the first time in the tester field.

We're still here, still healthy and still growing.

David H. Methvin
President

Computer Automation Inc.
Newport Beach, Calif.

Aerospace Industry Called Modern Welfare System

By Alan Drattell
CW Washington Bureau

WASHINGTON, D.C. – When politicians talk about welfare they generally refer to a program that is aimed basically at helping those unable to work or fend for themselves (or as some critics say, those unwilling to).

But we have in this country today a more sophisticated welfare program, much like the WPA (Works Project Administration) of New Deal days. It's called aerospace.

Aerospace is the modern welfare or WPA program that supports scientists and engineers, programmers and systems analysts. These people are, of course, working; they are employed on projects that eat up tax dollars at alarming rates.

D.C. Data-Line By Alan Drattell

They often work on projects that incur enormous cost overruns – such as the C-5A airplane – and that are often several years late in completion so that by the time they move from the drawing board to product application they are obsolete.

An example of the latter is the contractor who must finish phase one of a weapons system even though phase three is in use in the field.

This modern welfare system has come into sharp focus in the past few months because of the perniciousness of unemployment – a result of severe cutbacks in the aerospace program.

A good example of what havoc aerospace cutbacks can bring is Southern California. There scientists, engineers, programmers and systems analysts are pumping gasoline, driving cabs and performing other unskilled jobs because they cannot find work in their chosen fields.

Cutbacks in aerospace and in allied research and development have had a domino effect.

When a man loses his job he spends less money at the grocery store, and the little businessman in depressed areas such as Southern California, Long Island and Seattle, Wash., has been hurt in his cash register earnings.

The cutbacks have also created a psychological attitude that has crept into every aspect of the economy. When a major segment of the economy is hurting, others tend to worry when they might be affected. Thus, businesses, with little or nothing to do with aerospace, have been feeling the pinch and have been cautious in spending money.

The unemployed scientists, engineers, programmers and systems analysts cannot easily be retrained and certainly they cannot expect to continue to make the money they once earned while they would be relearning their trade – that is, relearning an expertise more in tune with the commercial marketplace that will need their talents in the decade ahead.

Some executive search firms are advising that these individuals go back to school to prepare themselves for the new job market that lies ahead. But it is pretty difficult for a man who earned $20,000 a year, has a wife and a couple of kids plus a heavily mortgaged home to go back to the books on a full-time basis.

Short of revving up the international arms race and pouring more money into unpopular and dubiously necessary space probes, the Federal Government must lend its hand in assistance.

And those of us in the computer industry must also look to our professional societies for guidance.

These associations have a great opportunity to demonstrate that they can play a greater role than collecting dues and running annual conference-show extravaganzas.

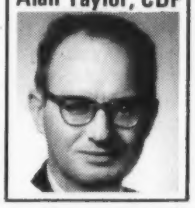
Management, Technical: Where Lies the Incompetency?

I happened to be in a senior executive's office while Mrs. Jeanette Williams was in action. Mrs. Williams is his secretary, and, during the conversation kept him informed of what was going on outside by means of little slips of paper, quite unobtrusive comments, and one or two suggestions.

Only one time during a fairly extended meeting did she have to exchange a few phrases to get a point settled. And it was during this exchange that her strength really came through.

The situation was that a salesman was offering to provide some data to the executive which really was not necessary. The data was available within the organization, and was already on its way to the executive's desk.

The Taylor Report
By
Alan Taylor, CDP



The matter was an important one, not a routine point but something that only comes up every four or five years – something which, in brief, the secretary had not met before.

The executive did not want to accept either the offered service, or to drop the conversation and take the telephone call. For one thing, although he had a number of reasons for his action, he realized that selecting the most appropriate one, and presenting it properly to the caller, could be important.

Addressing Mrs. Williams, he said: "I am sure that you can see how to do it – so you handle it please."

She did, effectively.

Later I was talking to Miss Belle Barrows. Miss Barrows is another executive's secretary. I do not know her well, but have exchanged the time of day with her and talked a little during the past few months.

I have come to know that she is both intelligent and reliable. She also is capable of taking few words from her boss and changing them into good, effective, English that really communicates. She can communicate either by phone, by letter, by memo or in person. She communicates effectively with all ranks within the organization, and with visitors.

This time she stopped me as I was going by and commented on the recent article "Parkinson, Peter, and Computer Selection Dilemma" [CW, Sept. 23].

This particular article suggested that in the same way that the Peter Principle argues that a person in an organization rises to his level of incompetence, so also important decisions (like computer selections) rise to a decision level of imcompetence.

Management Inability

The reasoning for believing that such a level is often involved in computer selection was because of the frequent inability of management and technical people to communicate properly.

Miss Barrows' comment on the article was "I enjoyed reading it. I liked reading it when I can understand it, and even I could understand that."

Naturally I was pleased. What writer does not enjoy praise. But reflecting later I became almost a little bit worried. Miss Barrows is an intelligent woman, and in putting herself down with the phrase, "even I could understand" – she was really falsifying her position.

She is much more successful at communicating with her environment than I am. Her comment could equally well – and more truthfully – have been more like, "At last you have managed to come up with a reasonable level of understandability."

Who Is Incompetent?

This opened up the whole question that had been left hanging in the Peter-Parkinson article. I had commented that the computer selection took place in a level of incompetency – but I had not even opened the question as to whether or not the management, or the technical side, was being incompetent.

Quietly Miss Barrows had given me an example, that I feel shows where the answer lies – at least 50% of the time!

Perhaps the incompetency is simply in knowing what are the points in which management will take an interest, and presenting them properly. Perhaps the incompetency is in being able to clearly differentiate between what is management's task, and what is the technical task.

If, as appears to be the case, executive secretaries like Mrs. Williams and Miss Barrows are capable of this type of selection, presentation, and communication – perhaps there should not be quite such a salary difference between us and them.

What do you think?

It is an interesting point as to whether it is the technical end that needs to sharpen.

© Copyright 1970 Alan Taylor. Reproduction in whole or part forbidden. The views expressed in this column do not necessarily reflect those of *Computerworld*.

The $64 Questions for the 'Isam' Overhead Contest

The $64 Model 40 Question

A user of an IBM 360/40 equipped with Model 2314 drives, and operating under the Disk Operating System, processed 200 transactions against a newly reorganized Isam File A, and used part of the information obtained from File A to update a different newly reorganized Isam File B.

The process included a retrieval of a control record from A, a search on A randomly to ensure that no current record had the particular identification, the insertion of one record onto File A and two new records onto File B, and then the return of the updated control record to File A.

At the start of the job each transaction took two seconds, and at the end took 35 seconds. All told the job took 1 hour, 50 minutes.

The $64 Model 50 Questions

A user of an IBM 360/50 with 2314A drives and operating under the full Operating System processed 1,308 new records from tape onto an 85-cylinder newly reorganized file (File A) with eight cylinders of independent overflow. The time involved was 1 hour, 9 minutes.

The tape had been previously sorted so that the records were presented sequentially in descending order so as to minimize the time involved. The record size was 450 characters, blocked five and with three blocks to a 2314 track.

On the same Model 50 installation, after the records were added, the resulting file, and a second file, File B, were processed for 400 transactions. The second file consisted of 63 cylinders of 150-byte records, with the records blocked 14, and again 3 blocks to a 2314 track. The processing consisted of going sequentially against File A, and updating it; then adding a record to File B randomly. Files A and B were held on different spindles.

The time involved totalled 1 hour, 25 minutes, with the adding of records to File A taking 1 hour, 9 minutes and the processing of the 400 transactions taking 16 minutes.

The $64 Model 65 Question

A user of an IBM 360/65 with 2314A drives had five Isam files – A, B, C, D, & E – spread over four spindles, with each file taking between 30 and 150 cylinders. All had been newly reorganized.

Five hundred transactions were processed at the highest priority then in use (12) to update each file.

The file arrangements were: A, record size 314, blocked 5; File B and C both record sizes 106, blocked 6; File D record size 21 blocked 9; and File E, record size 34, blocked 6.

The time for the job was 24 minutes, with 15 seconds of CPU time reported utilized.

Then:

To enter for the $64 Isam Overhead Question Contest, estimate what time the work necessary for any one (or more) of the above tasks really is, and send your estimate together with your calculations to: Alan Taylor, CDP, The $64 Isam Overhead Question Contest, Computerworld, 797 Washington St., Newton, Mass. – to arrive not later than Nov. 12, 1970.

Any reader is eligible to enter unless he has actual knowledge of the particular cases. No one can win more than one of the four $64 prizes, all of which will be awarded. In the case of more than one correct answer, the prize will be awarded to the person submitting the most meritorious calculations, in the opinion of the judges.

MANUFACTURING CONTROL SYSTEMS

- PURCHASE ORDER SCHEDULING SYSTEM
  Accurate control of Requisitions, Orders, Scheduling of Receipts and inplant movement of purchased material with optional interface to users inventory control system.
- COST CENTER PROFIT AND LOSS
  Actual vs. standard cost reporting of labor, material and overhead in detail by product groupings.
- CHEMICAL INDUSTRY PRODUCTION CONTROL SYSTEM
  Inventory, Purchasing, Work In Process Inventory, Standard Cost Reporting, Material Requirements explosion, Machine Loading, and Machine Requirements reporting for chemical processing or related industries. File Organization techniques utilized include the Bill of Materials Processor.

These systems are currently in use and the experience of the user is available for installation assistance.

We also have extensive experience in the installation and maintenance of OS-DOS Bill of Materials Processor Systems.

Call or Write: Tom McLaughlin
Systems for Advanced Information, Inc.
1240 Pawtucket Avenue
Rumford, Rhode Island 02916
(401) 438-1600

Save time...money...trouble...

Lease your Teletype equipment from RCA...

Model 33ASR (with tape perforator and reader) **$50 per month.**
Model 33KSR (send/receive) **$37 per month.**

- Immediate delivery in any quantity.
- Includes nationwide maintenance service by RCA's own technicians.

Call or write nearest office: RCA Service Company
A Division of RCA, Technical Products Service

Bldg. 204-2
Camden, N. J. 08101
Phone: (609) 963-8000
Ext. PY-4129

3310 South 20th Street
Philadelphia, Pa. 19145
Phone: (215) HO 7-3300 (Pa.)
(609) WO 3-2043 (N.J.)

1778 Marietta Blvd., N.W.
Atlanta, Ga. 30318
Phone: (404) 355-6110

5121 W. 161st Street
Cleveland, Ohio 44142
Phone: (216) 267-2725

43 Edward J. Hart Rd.
Liberty Industrial Park
Jersey City, N. J. 07305
Phone: (201) 434-2318 (N.J.)
(212) 732-9494 (N.Y.)

7620 Gross Point Road
Skokie, Ill. 60076
Phone: (312) 965-7550

2711 Irving Blvd.
Dallas, Texas 75207
Phone: (214) ME 1-8770

1501 Beach Street
Montebello, Calif. 90640
Phone: (213) 685-3092

RCA

Cuts Inventory by $750,000

Computer Is Definitely a Production Tool in This Firm

By Robert E. Weiler
Special to Computerworld

ROCHESTER, N.Y. – At General Railway Signal Co., manufacturing operations command 50% of the computer's entire workload, and since installation of a full-fledged manufacturing system late last year, the company has realized a reduction of $750,000 in annual inventory level, a significant improvement of on-time shipments, and four to six weeks slashed off the previous order cycle.

General Railway used to manufacture relatively simple electromechanical products; today, the mainstay of its business is production of complex electronic systems, involving 40,000 active parts and 160,000 dormant ones.

Many products are individually engineered, one-of-a-kind systems which may change even during the manufacturing cycle.

The firm is fortunate in one respect: fast, flexible information processing has long been ingrained in manufacturing management philosophy. Tabulating machine methods were applied to manufacturing in the 1920s, and computers utilized beginning with an IBM 650 in the mid-1950s and progressing through a 1401 to the present 360/40.

General views data processing as an integral part of manufacturing.

In 1965 programming systems run on an IBM 1401 with mag tape did not permit exploding bills of materials swiftly to the six or eight levels required on each product. It took five or six weeks to explode down to the lowest level of casting or raw material, and there was little chance of reducing lead times without streamlining.

Requirements planning was tied into an inventory system based on re-order points and economical order quantities.

Inventory had a tendency to pyramid at each level, with rather inflated safety factors.

More Responsive

Taking stock of the situation five years ago, the company determined to move towards a more responsive manufacturing system which would effect time and cost savings and improve delivery performance.

This indicated two key steps: requirements forecasting based on time series planning, with weekly "time buckets" and automatic allocation of material to specific open orders; and development of data base computer operations to access the information needed much faster and with greater accuracy.

The first move in 1966, was to put in a 360/30 with 2311 disk packs to store the data base. This system was expanded in July 1969 when the Model 40 was installed with high-capacity 2314 drives.

In October 1969, IBM's Production Inventory and Control System (Pics) was installed, which included the programming needed to upgrade the bill of materials processor and the requirements planning and order release system.

Five Master Files

The data base now contains 90 million characters of information, stored on disk. Five master files are inciuded:

- The inventory master file includes all indicative and reference information on a part, as well as stock balances and usage data.
- The bill of materials processor contains a "recipe" for every part and assembly with where-used data. There can be as many as 10 levels for some assemblies.
- The open transactions or open-order file hold the entire backlog of requirements for system contracts, product and replenishment sales, reflecting all orders in progress in the shop.

It includes exploded requirements at all levels by time series, to show when a particular assembly, part, or an entire order will be ready. Starting with a requested delivery date, it shows when the lowest level of inventory – the raw material – must be purchased to meet the shipping deadline.

- An order master file contains each order number, the customer's name if it's a shipping order, vendor name if a purchase order. It provides information on factory routing, and is pegged to reflect where-used data on open orders similar to information in the bill of materials processor.
- The operations planning file contains data on the routings and operations needed to manufacture every part listed in the inventory file. Included is loading data, run times, and standard costs.

This file is linked to the order master file and every detail on each customer order can be obtained through either file. All the requirements for a contract can be quickly reconstructed, and the status of each order is available on request.

As requirements for each systems contract are determined, they become part of the data base.

As stock replenishment orders are entered into the system they are automatically added to the open order file. The system produces shop packets containing all the necessary routing documents. The shop packet has needed changing only slightly in six years.

Minimize Queue

The system produces shop loading information to minimize queues at each work station. Run lists indicating priorities and telling how long a given job should take are provided the supervisors.

Time series planning has had the biggest impact. The computer program begins exploding requirements with the forecast or weekly time bucket date, and works down to the lowest level for each system or product, offsetting each successive level by lead time. Orders are released for production automatically for each level, when the time is reached for a part's order to go to the floor.

Before an order is prepared, the system automatically checks future requirements for the part, to determine whether it could be more economically produced in larger quantities. If so, the part is made in larger lot, and allocated to specific orders.

Major Contribution

Automatic allocation of materials and parts by computer has made a major contribution to the manufacturing cycle. This job would be impossible by hand, but the computer allows us to change an order date according to priorities. The change is automatically reflected in the allocation of every affected part and assembly!

While not directly related to manufacturing management, the computer is also used for design automation, which includes, as a major byproduct, the preparation of manufacturing wiring tables and numerical control tapes for the wire wrap positioning machine. Also produced from the computer output, are plastic wire tags to identify wires in complex systems.

Robert E. Weiler is factory manager at General Railway Signal Co. in Rochester, N.Y.

'Bread Baskets' Fill Customer's Needs

NEW YORK – "A half gallon of milk, two loaves of bread, and fill it with premium, please."

The way it works is you drive into the mini-supermarket, punch your grocery order on a keyboard, and while the computer is assembling your food order and a clerk brings it out, you fill your car with gas.

You pay the attendant for both gas and food, and drive off in little more than the time it would normally take for a trip to the gas station.

Somebody's fantasy? Nope, there's a store like it in operation already – it's been open for two and a half years, in fact and four more are being built right now.

The stores are called Bread Baskets, and they specialize in selling about 100 of the most frequently needed grocery store items, as well as gas. The stores are triangular, each side equipped with pumps and a 50-key terminal showing pictures of available items.

The attendant's terminal has the other 50.

The idea for the automated grocery store-cum-filling station was developed by John Hitchens. "Nothing bothers me more than sitting at a gas station for five minutes while my tank is being filled," Hitchens said.

A retired toy maker, Hitchens plans to add a dry cleaning pickup service and car wash to the operation.

The first Bread Basket has been running in Atlanta for over two years. Other stores are being built in Fayetteville, Raleigh, and Charlotte, N.C., and Winter Haven, Fla.

Once the customer punches in his order, the computer prints out the request inside the store, calculates the bill, and updates inventory. A clerk assembles the order and brings it to the customer. The process generally takes less than two minutes.

'Guinea Pig' May Learn to React To Commands Shown or Told to It

CW Midwest Bureau

STILLWATER, Okla. – A team of graduate students here at Oklahoma State University, under the direction of Dr. Victor Bolie, an OSU professor and holder of the Albrecht Naeter Chair in electrical engineering, is continuing on a project designed to make computers react to commands "shown" to them or "told" to them.

Using an IBM 1620 as their "guinea pig," Bolie and his group are attempting to program some human characteristics into the computer and have succeeded in making the machine recognize some patterns.

Previous work has allowed the group of researchers to make the basic steps toward giving commands vocally to the computer. Recently, a breakthrough came that would allow the team to give commands visually.

Dr. Donald E. Morris, using a TV camera and a complicated maze of circuitry, built the ability to recognize black and white into the computer.

Another researcher, Wen Shyong Su, a doctoral candidate in electrical engineering, was able to refine the circuitry and the computer's sensory facilities so that the machine can now recognize four shades of gray (of a TV picture).

Confused Cattle Share Their Barn With a Computer

WILLIAMSTON, Mich. – The Angus cattle at Mahogany Farms here are a little confused as to what's going on in their hayloft.

But the owners of Mahogany Farms don't appear to be. They've installed a Honeywell Model 110 in the hayloft and are running research programs on it.

Mahogany is analyzing data on purebred beef sires in an attempt to develop cattle that eat less, grow faster, and supply tastier steaks and roasts.

When a sire with superior characteristics is identified through the research, his blood line is passed on to thousands of cows by means of artificial insemination, according to Ray Records, director of herd surveillance.

Looking for terminals at substantial discounts from manufacturers list prices?

Immediate delivery on new:

teletype writers, CRT's, acoustic couplers,

hard wired modems

Contact:

Terminal Equipment Exchange ,Inc.
833 Frito Lay Tower
Dallas, Texas 75235
(214) 358-3404

PROGRAMMERS

Immediate openings in New York Metropolitan area. Require two years minimum S/360 BAL experience. Real time desirable.

Salaries $10,000 – $18,000.

Send resume and salary history to:

CW Box 3275
60 Austin St., Newton, Mass. 02160

We call it "MOM."
She pays her own way.

MOM, our new Micromation On-Line Microfilmer, pays her own way. Just two small printout applications per month make MOM self-supporting. Your savings in postage and paper alone can absorb her monthly rental rate. The rest is pure gravy.

How full is "full performance"? For openers, MOM is a giant step ahead in resolution and micro-imagery. DatagraphiX' CHARACTRON® Shaped Beam recording sees to this. MOM is a total package. That means everything is standard. Like: ☐ our Universal Camera for recording images on 16mm, 35mm, 105mm ☐ both comic and cine mode sequencing ☐ both roll film and microfiche ☐ a built-in controller and forms projector ☐ 25X and 42X reductions ☐ fully software-supported ☐ direct data conversion from any IBM 360 model 25 and up. And so on.

All for an honest $49,000. Or low leasing if you prefer. A great bargain for a great MOM, or the DatagraphiX 4200, MOM's official title.

It's easy to afford the brightest picture of COM. For more information about COM's MOM, please write or call us.

DatagraphiX

Stromberg DatagraphiX, Inc
a General Dynamics subsidiary
P. O. Box 2449, San Diego, California 92112
(714) 283-1038 TWX (910) 335-2058

Service Bureau Head Gets $85,000 in Bank Suit

CW Midwest Bureau

ST. PAUL, Minn. – A jury has awarded $85,000 in a civil suit to Michael Sackman of Minneapolis for breach of contract by the American National Bank here.

Sackman, president of Desotec, a service bureau, contended that the bank had not lived up to a contract it had made with him.

According to Sackman's attorney, Stanley E. Karon, Sackman was to develop a general ledger bookkeeping system for American National. He claimed breach of contract by the bank for the bank's failure to provide adequate computer facilities.

The bank, through its attorneys, contended that there was in fact no contract.

Judge Phillip Neville of the Federal District Court here directed the jury that a contract did exist and left it to decide whether Sackman had fulfilled his part.

An appeal was filed by the bank, and at a hearing the bank contended that the award was made under passion and prejudice and with errors of law, requesting a new trial. No decision has been made on the appeal.

American National is also a defendant in a suit by the Association of Data Processing Service Organization (Adapso) which seeks to exclude American National from the data processing field and is asking $500,000 in damages for restraint of trade.

Firefighters Turn to Computers for Help

Firefighters are turning to computers for help in two communities.

In Allegheny County, Pa., an area that sees an estimated 30,000 rail or truck chemical shipments each month, two firefighters from Pittsburgh and Mt. Lebanon have developed a chemical-fire data base.

Their work includes listing the properties of about 30,000 chemicals, including the hazards they would present if involved in a fire, the best agent for extinguishing such a fire, and 19 other points that will enable a firefighter to cope with a fire most effectively.

John R. Leahy Jr. and Dan Aston have spent two years developing the system.

Their work will be accessible to any fire chief in the county to aid him in choosing the best strategy for fighting a chemical fire.

Also scheduled to go into the computerized data base are data on the location of the closest U.S. demolition team – information valuable when explosives are involved.

Meanwhile, in Wichita Falls, Texas, local fire agencies have constructed a simulation model of fire experience that gives them some ability to predict likely fire locations.

Built under a $150,000 grant from the Department of Housing and Urban Development, the model uses surveys and building sketches made by officiers of two of the city's seven fire districts. The model also helps schedule fire inspections.

Model May Aid School Imbalance

SANTA MONICA, Calif. – A computer will be used to devise a plan for racially integrating the local school district here. Santa Monica has contracted with System Development Corp., at a cost of $10,000, to use its computerized integration model to smooth out changes in student enrollments to achieve a more equitable racial balance.

Parameters to be fed into the computer include such things as the maximum number of blocks a student should be expected to walk, the desired minority enrollment per school, and bus travel pattern.

The data base will be the age, grade and race of every child on each street.

ADVERTISING & PROMOTION
FOR THE
DATA PROCESSING INDUSTRY

PROFESSIONAL SERVICES FOR THE SMALLER COMPANY
USA–430 EAST 56 STREET NEW YORK CITY 10022 (212) 758-0792
A DIVISION OF THE SILBER SYSTEM INC.

WESTINGHOUSE CARRIER · XEROX BOISE CASCADE MONSANTO UNION CARBIDE JOHNS-MANVILLE B.F. GOODRICH · SHERWIN-WILLIAMS · GENERAL RESEARCH · DEERING MILLIKEN

for new development watchers

Our constantly-improved Cobol software products are now operational in more than 100 organizations. You can evaluate their benefits for your department and your management in a brief, profitable two-and-a-half hours . . . at our

FREE SEMINARS
for Systems and Data Processing Managers
on the
GENERAL RETRIEVAL SYSTEM (GRS)
and the
GENERAL MAINTENANCE SYSTEM (GMS)

November 3 - [illegible] November 18 - Hartford
November 4 - Washington, D.C. November 19 - Tulsa
November 4 - Toronto November 20 - Dallas
November 10 - Buffalo November 24 - Rochester
November 10 - Philadelphia November 24 - Milwaukee
November 12 - Boston December 1 - Detroit
November 12 - Minneapolis December 3 - Cleveland
November 17 - Pittsburgh December 10 - St. Louis
November 17 - Cincinnati December 15 - Atlanta
November 17 - New York City December 17 - New York City
November 18 - Houston December 18 - Chicago

To: Information Science Incorporated, New City, N.Y. 10956

☐ I accept your invitation. I'd like to attend your seminar on _____ in _____

☐ I'd like to know more. Please send me your General Information Manual and a copy of The Seminar Agenda.

Name and Title _____
Company _____
Address _____
Telephone _____

Information Science Incorporated
[illegible] New Hempstead Road, New City
Rockland County, New York 10956 (914) 634-8877

CAMBRIDGE COMPUTER ASSOCIATES, INC.

ANNOUNCES

AUTOGRAF™

an entirely new approach to printer graphing

for the System 360

AUTOGRAF allows nonprogrammers to produce completely labeled bar graphs, profile graphs, and point-plotting graphs by merely selecting the appropriate output control statements from the wide range available. AUTOGRAF automatically calculates coordinates, and performs scaling and formatting, leaving the user entirely free to concentrate on what the content of the graph should be, rather than how to produce it.

AUTOGRAF can print several graphs on one page, or spread a graph over many pages. It can display multiple scales and variables in a single graph. Sampling of data to be plotted is provided, as is the capability for interfacing with user-supplied functions.

A complete descriptive brochure is available.

Cambridge Computer Associates is known internationally for proprietary software products. We welcome your inquiry about AUTOGRAF, CROSSTABS™, PROFILE™, UTILITY-CODER™, or REACT™, at either our Cambridge or Los Angeles office.

220 Alewife Brook Parkway, Cambridge, Massachusetts 02138 (617) 868-1111

5455 Wilshire Blvd., Suite 1800, Los Angeles, California 90036 (213) 933-1490

new answer: the Codex 4800!
new answer: the Codex 800!
same answer: Codex!

question: what new data modem provides the best price/performance combination available today?

question: what new multiplexer uses time division and features building-block versatility at low, low cost?

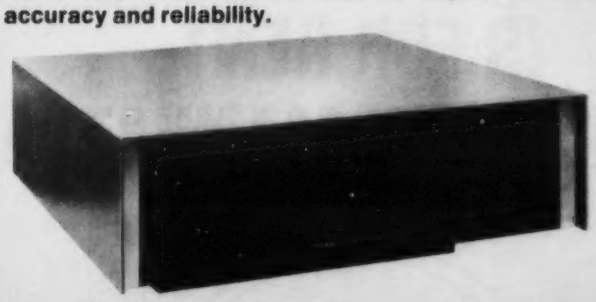
question: who set the pace for high speed in data communications at 9600 bits per second?

here are more answers:

CODEX 4800 HIGH SPEED DATA MODEM

- automatic adaptive equalization
- performance indication
- unattended operation
- narrow bandwidth
- network fault isolation.

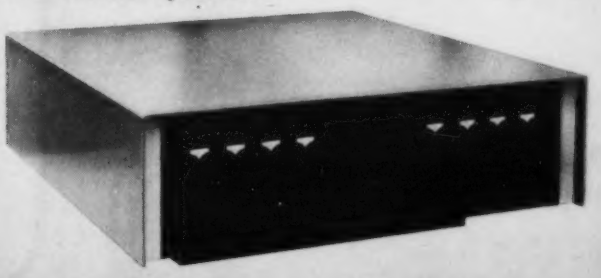
The new 4800 series of data modems operates over dedicated, unconditioned lines at unprecedented accuracy and reliability.



CODEX 800 TIME DIVISION MULTIPLEXER

- Services all asynchronous data speeds.
- building block configurations prevent obsolescence as requirements grow.
- interfaces to *any* data modem.

This new Codex 800 family of TDM's offers system flexibility never before available in multiplexer/ concentrator systems.



any questions?

Send me the Codex "Instant Answer Package" of complete specifications.

Name _____

Company _____

Street _____

City _____

State _____ **Zip** _____

Call me at: (**)** _____

codex
the answer people

CODEX CORPORATION
15 Riverdale Avenue
Newton, Massachusetts 02195 (617) 969-0600

See us at Booth 3630 FJCC

Sub-lease

2-2311/2841

Take over remainder of lease at discount from IBM rates. Continuous IBM maintenance. Transportation/installation paid.

Contact: Richard Dysart
Bowne Time Sharing, Inc.
345 Hudson Street
New York, N.Y. 10014
Tel: 212-989-6006

IBM Expected to Go Slow on Microcode

By Don Leavitt
CW Staff Writer

BUFFALO, N.Y. – IBM won't make its microcode specifications available to the general user in the foreseeable future. And it will do everything it can to discourage independent use of the microcode and the Reloadable Control Storage on the 370/145.

That at least was the impression of the participants at the fourth annual Microprogramming Workshop held here recently under the sponsorship of the ACM SigMicro and the IEEE Computer group.

While the 150-odd participants saw IBM following a "go-slow" approach, they expected other manufacturers to include microprogramming as new machines are announced, and to make the microcode available to the users.

The workshop continued to reflect the differing concerns of the manufacturers and the users, but there was more interest this year in the uses of microprogramming rather than machine design considerations.

Microdiagnostics were seen as one of the more important uses of microprogramming and half a dozen papers were directed to that area, including one related to the 360/30 by A.M. Johnson.

The successful emulation of a Burroughs 220 on a 360/25, despite the radical difference in the two machines, was reported by T. Schoen and M. Belsole of the University of Dayton.

Other papers were presented on the functional characteristics of a multilingual processor, on IBM's integrated emulators and an array-oriented technology.

Formal papers are being considered for publication in a special issue of IEEE *Transactions on Computers* and copies of papers and abstracts are available from ACM.

Tentative plans were made for the fifth annual workshop next autumn.

Will It Be Death by 'Fire and Ice'? Maybe Atomic Bullets or Lasers?

CW Midwest Bureau

FONTANA, Wis. – If what the scientists of 35 countries – the U.S. and USSR included – say is true, the next world war will be started by mechanical devices and the technicians controlling them, and not by the decisions of presidents or premiers.

The scientists, nearly 160 strong, attended the Pugwash Conference on Science and World Affairs here.

The Pugwash Conference is sponsored by the Adlai Stevenson Institute of International Affairs.

In a pre-Pugwash Conference report which is soon to be published by MIT Press, the scientists warn of "Flash Gordon-like weapons" such as lasers and "atomic bullets" which would be a part of weapons systems controlled by soon-to-be-developed sensors and computer systems.

In a press statement, the scientists said: "There is already a growing dependence of [arms] systems on complex and rapid computer-controlled response and consequent erosion of the control of political leaders over final decision."

According to the scientists, such systems lead to arms systems which would be triggered on warning of attack. They feel that such systems would place the responsibility of starting or not starting a war on machines (radar, sensors, computers) and the people who operate or design them and not in the hands of statesmen.

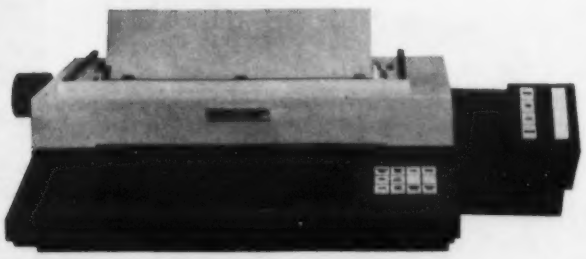
PDP-11 USER?

If you are now using a PDP-8 and would like to move up to a PDP-11, but are being held back by software conversion costs,

or you now own a PDP-11 and would like to utilize existing PDP-8 software,

then you need **EMUL8**, the only complete PDP-8 emulation package for the PDP-11. The **EMUL8** system includes functions for loading, running, and debugging PDP-8 family programs on the PDP-11. For further information, write or call:

Gene Sengstock
CANBERRA INDUSTRIES, INC.
45 Gracey Ave.
Meriden, Conn. 06450
(203)-238-2351



Novar terminals can be equipped for *automatic* detection of errors caused by noisy phone lines — and for *automatic* correction by retransmission. Assures that only correct data goes to the computer. Models 5-50 and 5-51.

Novar Corporation • 2370 Charleston Road
Mountain View, Calif. 94040 • (415) 964-3900
Offices In All Principal Cities

novar

A Part of General Telephone and Electronics

RARE OPPORTUNITY:

MAJOR CORPORATION REGIONAL COMPUTER CENTER IS FOR RENT IN MIDTOWN MANHATTAN

AT 315 PARK AVENUE SOUTH

BEAUTIFULLY ARRANGED AND PERFECTLY EQUIPPED TO HANDLE SOPHISTICATED COMPUTER OPERATIONS. COMPLETE WITH FLOATING FLOORS AND HEAVY ELECTRICAL INSTALLATION

MODERNIZED, FULLY AIR CONDITIONED. CENTRALLY LOCATED WITH EXCELLENT TRANSPORTATION FACILITIES.

Available For Immediate Occupancy

3 FLOORS
Each 11,747 Sq. Ft.,
Total: 35,421 Square Feet
(Will Rent ALL Or Part)
Many Special Features Including 2 Raised Floors Designed Especially For Computer Operations and Off-Street Loading Facilities

Agent CROSS & BROWN COMPANY

522 Fifth Avenue,
New York, N.Y.
(212) 687-9200

Our new teleprinter runs so quiet we had to fake a little noise.

Operators couldn't get used to the eerie quiet of the keyboard on our new TermiNet®300 teleprinter.

So we added a little noise to give them some "feel." Even then it's quieter than an office typewriter.

And when it's running as a high-speed printer from tape or computer it's quieter still.

A front-panel switch lets you select a speed of 10 characters per second. That makes it compatible with the leading communications terminal. Or a speed of 15 characters per second. That makes it compatible with the leading computer terminal.

Or its unique speed of 30 CPS. Which makes it compatible with your special requirements of data handling, and saves you money.

But quietness and speed aren't all. We've built a whole raft of versatile features into the TermiNet 300 printer. That way it'll take care of your needs for years to come.

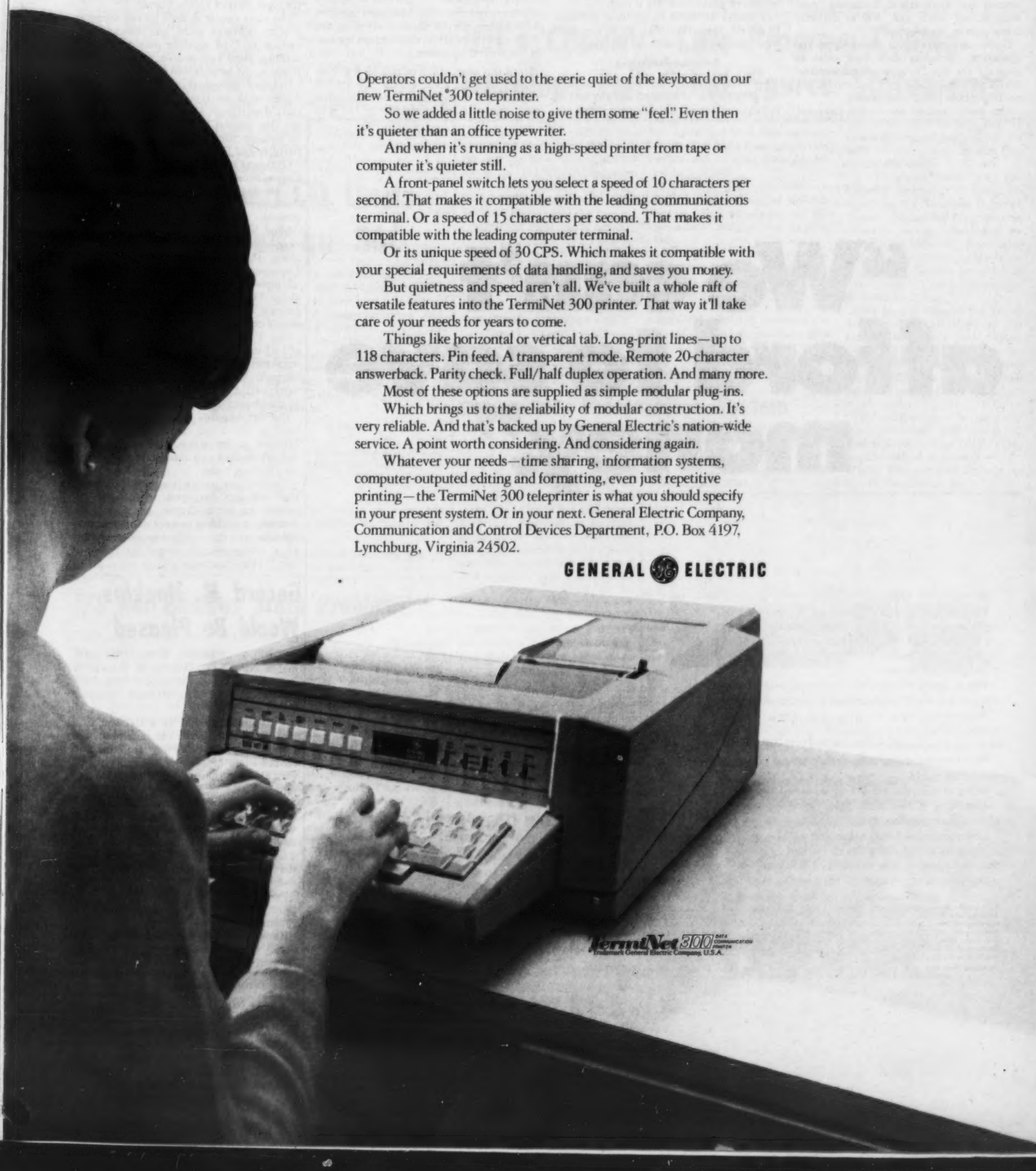
Things like horizontal or vertical tab. Long-print lines—up to 118 characters. Pin feed. A transparent mode. Remote 20-character answerback. Parity check. Full/half duplex operation. And many more.

Most of these options are supplied as simple modular plug-ins.

Which brings us to the reliability of modular construction. It's very reliable. And that's backed up by General Electric's nation-wide service. A point worth considering. And considering again.

Whatever your needs—time sharing, information systems, computer-outputed editing and formatting, even just repetitive printing—the TermiNet 300 teleprinter is what you should specify in your present system. Or in your next. General Electric Company, Communication and Control Devices Department, P.O. Box 4197, Lynchburg, Virginia 24502.

GENERAL ELECTRIC



Louisiana — Part III

State DP Center Serves 25 Divisions With Univac 494

By Edward J. Bride

BATON ROUGE, La. – General improvements in the efficiency of user agencies, plus sizeable cost savings, have been identified as concrete, factual benefits of the State Computer Center here in the capital.

The center serves about 25 different divisions, including the State Police, with a three-year-old Univac 494 system. The police also use a Univac 418-II for the various law applications, including communications with the FBI's national crime post in Washington.

There are dozens of applications in operation, including such basic ones as payrolls for the Division of Administration and Department of Corrections, including all the penal institutions.

Also computerized are royalty payment reports and lease history files for the Louisiana Mineral Board, and a base file for computing percentage contributions to the Teachers' Retirement Fund and the necessary reports to manage each teacher account.

Additionally, it was determined that the processing for the State Employee's Retirement System could be done more efficiently at the state center, and all work was transferred for a resultant savings of about $24,000 a year.

Programs designed to perform searches to locate taxpayers who have not filed state income tax returns are also used.

Revenue-Producing

An estimate of the tax due from unfiled tax returns was computed and the lists of delinquent taxpayers are being audited against tax returns now on file in the state. Persons who should have filed a Louisiana return are being sent delinquent notices.

In other tax accounting, the center is processing oil and condensate severance tax reports that are now fully operational.

Finds Federal Funds

More than twice the amount of money appropriated for the Louisiana budget, $1.4 billion for 1970, is received by the state and its political subdivisions annually for federal programs.

Until this year, much of this $2.8 billion flowed into the state without the knowledge of the commissioner of administration, the principal assistant to the governor and the state's chief fiscal officer.

In many cases, additional money could have been received through a consolidation of requests. Further complicating the problem was a frequent lack of communication between federal agencies and the state government.

An executive order created the state Commission on Intergovernmental Relations to serve as the clearinghouse, at the state level, and as the coordinating agency for eight district review boards.

The state center is used by the commission to organize, store, and review information on 514 services provided by individual state agencies for which federal funds might be obtained.

Detailed information gathered by the commission on these services crosses all state department and agency lines. This is the first project to list, catalog and assist in gaining funds for all state agencies, parishes and municipalities.

Louisiana's Intergovernmental Relations Commission's computer-assisted program is now operating so well that the Federal Government has designated it as a pilot project.

Some other states are expected to pattern their intergovernmental agencies along the lines already established in Louisiana.

Louisiana has taken still another step ahead in the matter of fiscal control by putting the executive budget on the state's central computer.

The Public Affairs Research Council (PAR) of Louisiana, Inc., an independent organization supported by private funds, assigned A.R. Thiel, research director, to work with budget officials at the request of the governor's office.

Through the use of the computer, according to Thiel, Louisiana can look forward to more complete and comprehensive budget and financial information on a current basis.

"One of the results is a budget program that will give Louisiana an in-depth approach to expenditures, which include control of staffing requirements of state agencies and the eventual implementation of a computerized central payroll system," Thiel concluded.

"We can't afford to save money."

Sounds funny, doesn't it?

But whenever a company says they're too small to afford Autoflow... that's really what they're saying.

Almost any EDP operation, large or small, has programs that need documentation for maintenance, debugging or programmer review.

We designed Autoflow to solve these problems. Problems that are actually felt more acutely in smaller operations.

And because we're always building in new features, companies that hadn't considered using Autoflow before, now find it necessary for an efficient operation.

Right now there are over 1400 Autoflow installations around the world.

Many of them the biggest names in industry.

And many of them small. Shipping companies. Manufacturers. Universities.

Call your nearest ADR office and we'll be glad to come by and demonstrate all the ways Autoflow can save time and money in your operation. No matter how small.

Everyone is big enough to save money. And time.

If you couldn't justify Autoflow before... look again.

There have been additions to help in debugging. Like three new listings for 360 assembly users (EQU, Macro Usage and Modified Tag Summaries). And new features for 360 COBOL users. That's in addition to our 14 languages and 12 listings.

To help in conversion and maintenance of second generation programs we've released our 360 system that processes 1400 series Autocoder and SPS, and our 7070 and 7080 Autocoder Autoflow Language Processors.

In all, the 1970 Autoflow is three times more comprehensive than the original. And we're constantly working on newer features.

That's a lot to look at.

APPLIED DATA RESEARCH
THE SOFTWARE BUILDERS
CREATORS OF AUTOFLOW, METACOBOL, LIBRARIAN, SAM, ROSCOE, IAM, STAR AND PI SORT

Call your nearest ADR office:
Atlanta 404-233-3087/Boston 617-246-0167/Chicago 312-692-7153/Cincinnati 513-531-3060/Cleveland 216-331-1608/Dallas 214-638-3890/Detroit 313-875-5721/Hartford 203-643-1597/Houston 713-526-3188/Kansas City 816-753-5372/Los Angeles 213-826-5527/Miami 305-751-8551/Milwaukee 414-964-7720/Minneapolis 612-333-6050/New York 212-986-4050/Philadelphia 215-835-2088/Pittsburgh 412-391-3439/Rochester/716-442-0420/San Francisco 415-981-4740/San Juan 809-725-0264/Seattle 206-682-3244/St. Louis 314-862-2120/Washington 703-524-9880. *Foreign Cities:* Amsterdam 020-76-38-98/Bruselles 11-94-70/Dusseldorf 0211-32-34-71/Geneve 41-22-43-93-60/Johannesburg 42-8212/London 01-242-0021/Milano 86-08-07/Oslo 41-51-79/Paris 533-57-20/Stockholm 60-86-11/Tokyo 742-1291.

Applied Data Research, Inc./Route 206 Center/Princeton, New Jersey 08540/Telephone: 609-921-8550

Gerard M. Hopkins Would Be Pleased

CORPUS CHRISTI, Texas – An automated New York Review of Books? A 370/165 sitting in the editor's chair? An on-line *Sunday Times Book Review?* Could be.

A computer guided by a Del Mar College professor here has analyzed the poems of Gerard Manley Hopkins and ranked them in an order of quality that is very close to the ranking given by human critics.

Everett Gene Powell based his statistical ranking on coined works, unconventional syntax, and word count per line, and attained a Ph.D. from the University of Texas for the effort. His 1,040 page thesis consists largely of computer printout.

Powell began his project in 1962 and used 17,000 punched cards during his research.

Hopkins, a major Victorian poet, was a Jesuit priest who lived in the British Isles from 1844 to 1889.

DP School Is Bilingual

NEW YORK – Spanish-speaking students may learn keypunching at a bilinqual computer school, Tutoring Techniques Systems Inc. The owner and operator, Johnny Alvarez, hopes those learning keypunching may advance to operations and programming.

360/DOS Utilities Feature High Speed, Reliability

By Don Leavitt
CW Staff Writer

PITTSBURGH, Pa. – A set of utility programs from Westinghouse Tele-Computer Systems Corp. (WTCS) allow DOS/360 users to copy data files between tapes and disks faster and with more reliability than is possible with IBM-supplied software, according to the company.

The Dump/Restore/Copy utility package consists of three separate programs, to handle disk-to-disk, disk-to-tape and tape-to-disk copying of files. WTCS said the programs are completely compatible with IBM's DOS and are self-relocating, so that they can be used in either background or foreground partitions.

WTCS claimed that its utilities are two to three times faster than IBM's when copying files including variable length records, such as DOS system residence and indexed sequential files. The company said that dump speed is virtually independent of the format of the data being processed.

Supplementing the read-after-write automatically provided by the recording heads on most tape units, the Westinghouse utilities provide verification of data after each disk write, under software control. WTCS said that although this adds as much as 10% to the time needed to dump a complete disk volume, it insures complete verification of the copying.

Unlike the IBM software, the Westinghouse programs are able to dump multiple disk volumes serially onto a single tape, maintaining the volumes separate identities so that they can be restored independently of each other, if the user desires.

No programming is required on the part of the user. Some JCL changes, and at least one parameter control card, are required to implement each program, WTCS said. The packages require a minimum of 10K bytes of storage for use with 2311 units, or 14K bytes for 2314 environments.

The three utilities are available as a single package for $700, the disk-to-disk program can be bought separately for $234. Logically the disk-to-tape and the tape-to-disk programs would have to be purchased together at a combined cost of $468.

Westinghouse Tele-Computer Systems Corp. is at 2040 Ardmore Blvd.

Programs for CCD Units Are Assembled on 360

CHAMPAIGN, Ill. –Problem programs for any of the 16-bit CPU's from Honeywell's CCD division can be assembled on an IBM 360, by using the ATI-16 Assembler package from Automation Technology Inc. (ATI).

While the new package can use the IBM machine as a host for the assembly process, it does not, however, provide a means of testing the resultant object programs.

The ATI-16 can accept source code written for the Honeywell DAP-16 Assembler, but, by utilizing the larger core storage capabilities of the 360, it provides the user with enhancements that are unavailable on the standard assembler.

Under ATI-16, for example, the user can have more complex relocation calculations than are possible with the Honeywell processor. He may also use parenthesized subexpressions and arithmetic operators. ATI's assembler also provides a non-parameterized macro facility and more generalized literals to generate any data in decimal or octal format, anywhere in an expression.

ATI-16 is said to be able to generate Honeywell 16-bit object code from any 360 Model 30 or higher that has 64K or more bytes of storage, under OS/360.

The assembler is available under a license agreement for $2,500.

Automated Technology Inc. is at Two Henson Place.

T/S Net Handles State Problems

WILMINGTON, Del. – Administrative and planning officials on the community or state level can use specialized time-sharing services developed by Sci-Tek Inc., to study problems of air pollution, land use and resources allocation, and political redistricting.

By entering meterological data and readings from air pollution monitoring stations in their areas, pollution-control authorities can be provided with complete graphical profiles of their areas, pinpointing best/worst zones. In some cases, specific offenders can be identified through a pattern of pollution concentration lines developed by the system.

The concentration lines are generated by a CalComp General Purpose Contouring Program, using data from the monitoring stations and estimated data from "phantom" monitoring stations.

The land use service is said to give city planners and architects an awareness of combinations of land use and resource allocation that might have escaped their attention under manual systems of study.

The political redistricting service is described by Sci-Tek as being strictly non partisan in its consideration of statewide or local divisions. Built on a data base of census information, the service can be geared to consider either population equality, physical contiguity or compactness as the primary factor in a redistricting effort. Presumably various alternative plans could be generated for authorities to study.

There is no initiation fee for the Sci-Tek time-sharing services, nor is there a minimum monthly billing. The company charges from twenty cents to fifty cent/sec for CPU time, and $10/hr for connect time when the user is transmitting at less than 1,200 bit/sec. There is no connect time charge for transmissions at higher speeds, a Sci-Tek spokesman said.

There is a $1/thousand lines of print charge, and Sci-Tek also has a 10% charge back for communications costs.

Sci-Tek Inc. is at 1707 Gilpin Ave.

DTI's 'Cobility' Cuts Program Coding, Develops Full Cobol Source Statements

ALEXANDRIA, Va. – Cobol programmers can reduce the amount of writing in their coding and still have complete statements in the source programs used for compilation, by using a Cobol utility program from Data Technology Inc. (DTI).

According to DTI, the Cobility program reduces the programmers' efforts in two ways. A "Shorthand translator" accepts abbreviated forms of Cobol reserved words and phrases, and expands them into the complete forms required for the compiler.

A "range change" feature allows the user to enter short mnemonic data names and these are expanded into fully descriptive, pre-defined data names that would aid in later maintenance of the program.

Cobility also provides reformatting of data division entries and statements in the procedure division for reading ease.

The ability to make massive, repetitive changes throughout a program with a single entry is another feature of Cobility, according to DTI.

The reformatting includes the indentation of subordinate data fields, as defined by level number, in the data division, and the repositioning of statements for ease of correction in the Procedure Division.

A batch-oriented package, Cobility is similar in many respects to the Terminal Oriented Cobol Application Programming (Tocap) package developed by DTI earlier this year. One major difference, however, is the omission in the Cobility program of the 'decision table translator' featured by Tocap.

This feature allowed the Tocap user to enter his logic in the form of a decision table, which Tocap would convert into complete source statements, utilizing IF and ELSE to cover all possibilities, including any defaulted by the coder.

The package can be used on any 360 with 30K bytes of storage, under either DOS or OS, and it is priced at $2,000.

Data Technologies Inc. is at 206 N. Washington St.

M-810, CIP-2100 Mini Users Get Assembler, Information System

LOS ANGELES – A one-pass assembler for the Microsystem 810 or Cincinnati Milacron CIP-2100 minicomputer has been developed by General Analytics Corp. (GAC).

GAC said that it has also developed an information management system for the minicomputers, that permits both source and object programs to be stored on a magnetic tape file. This file permits each program to be stored, updated and retrieved by file name.

The GAC M-810 assembler allows the M-810 or CIP-2100 user to read a source paper-tape to disk, assemble the program, record the object program on magnetic tape or disk, and produce a new source program on either paper tape, magnetic tape or disk.

GAC said that the standard M-810 Assembler is paper-tape oriented and requires two separate passes to produce an object program.

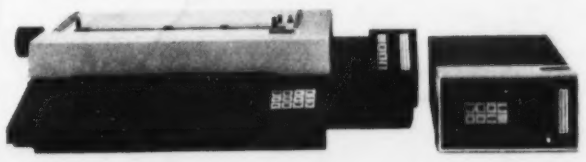
GAC said that both the assembler and the information management system are currently implemented on a configuration which includes an Iomec disk unit, but both are readily adaptable to other secondary storage equipment. The Assembler is priced at $2,000.

General Analytics Corp. is at 9841 Airport Blvd.

HP Lists Software

PALO ALTO, Calif. – Hewlett-Packard computer users can utilize the updated program catalog.

Hewlett-Packard said that copies of the 1970 Program Catalog may be obtained from any H-P sales office or by writing on company letterhead to Inquiries Manager, Hewlett-Packard Company, 1601 California Avenue, here.



It's the complete business data communication terminal — it can also be used as a regular electric typewriter—as a high-speed interoffice teletypewriter — as an automatic letter writer. It's the versatile Novar 5-51 System.

Novar Corporation • 2370 Charleston Road
Mountain View, Calif. 94040 • (415) 964-3900
Offices In All Principal Cities

novar

A Part of General Telephone and Electronics

Picky processor?

CPU's get mighty picky on a paltry diet of proverbial punched cards.

That's why Inforex developed Intelligent Key Entry.™

Inforex feeds hungry CPU's. It does electronically what other forms of data entry do mechanically.

The Inforex system gathers data from eight keyboards into one disc memory unit. Data may be sight or key verified. Built-in logic performs check digits, left-zeros and balance totalling. Jobs are pooled onto 7 or 9-track compatible tape. Optionally, it will operate on-line directly to your central processor.

Keypunch/verifier functions. Starting with the familiar 64-character keyboard, each Inforex keystation performs all keypunch and verifier functions: Automatic check-digit computation. Automatic left zeros. No digit by digit keying is necessary. Electronic skipping and duplicating rather than mechanical. Auxiliary duplication or two additional levels of program control. Automatic + or − signing of fields.

Simultaneous entry and verification. All eight keystations input to one disc memory unit. Each keystation is assigned an area as it enters. Any keystation can access any assigned area at any time. Since each keystation has both sight and key verification capability, one keystation can verify work entered on another and if desired, verification can be done simultaneously with data entry.

Keyboard to tape functions. Inforex automatically pools input from up to eight keystations onto 7 or 9-track compatible tape. One easily entered statement transfers a series of batches. Only one keystation is required to initiate the transfer, and all keystations are functional during transfer. There are no cartridges to handle or identify, no special equipment needed for pooling.

Recallable programs. Each program has four levels of control. Once the program is keyed, it can be stored for future use and recalled by any operator merely by keying its appropriate program name. Up to 128 different program controls can be stored. There's no program card or tape mounting and no repetitive program control keying.

Self-balancing. Zero balancing is an integral part of the Inforex system. Each operator may accumulate a control total during data entry. Edit controls allow rapid correction. Adjustments to the balance total occur automatically during verification.

125-character records. With Inforex Intelligent Key Entry, the record length is variable up to 125 characters.

Full record display. For added accuracy, each keystation displays an entire 125-character record with moving cursor and position counter. The system has a forms capability that allows data entry and verification in a "fill-in-the-blank" fashion. Operator messages for direct interaction with the system along with search and paging of a file are standard.

Attractive office decor. Inforex design innovation doesn't stop with the components. Each Inforex keystation is built into an attractive contemporary walnut and black steel desk designed for operator ease and comfort. And remember, the system is electronic, not mechanical, allowing a quiet, comfortable atmosphere to work in.

Inforex monthly rental cost is $50 per keystation. $560 for control unit (up to 8 keystations). $960 for a complete 8 keystation system, including maintenance.

Inforex, Inc., 21 North Avenue, Burlington, Mass. 01803 or, Inforex AG, Dornacherstrasse 210, Basel, Switzerland.

"Inforex it."

GT&E's 'Atlas' Reports on Status, Location of Tapes

TAMPA, Fla. – Tape-oriented installations operating under OS/360 can record the current status and location of each tape with the Automated Tape Library Accounting System (Atlas) from GT&E Data Services.

According to GT&E, Atlas' monitoring of the retention period of each tape avoids premature purging while making scratch tapes available at the earliest possible date. External tape labels can be generated by Atlas to improve legibility and provide uniformity between Atlas reports and the tape labels.

To use Atlas, a master file is generated containing serial number and historic data of each tape in the library. Each time a data set is written on a tape, that information is noted on an input document. According to GT&E, this document can be a punched card, mark-sense document or any other medium desired by the user.

Run on a batch processing basis, Atlas edits each of the input trasactions to avoid duplicate entries or other basic errors. Each time a new data set is written on a tape, the system increments a usage count which is monitored for tape cleaning controls.

The system generates eight standard reports including volume retention by application, volume purge, remote site movement, remote site inventory and scratch tapes available.

The purge report includes a list of those tapes that are considered in need of cleaning, based on the usage count.

The remote site movement report lists all tapes scheduled for transfer from one location to another, and indicates specific "to" and "from" locations.

The Atlas package for OS/360 is available without installation, for $8,500. Installation adds $700.

GT&E Data Services is at 5422 Bay Center Drive.

'Insta-Tax 70' T/S Service Can Prepare Returns

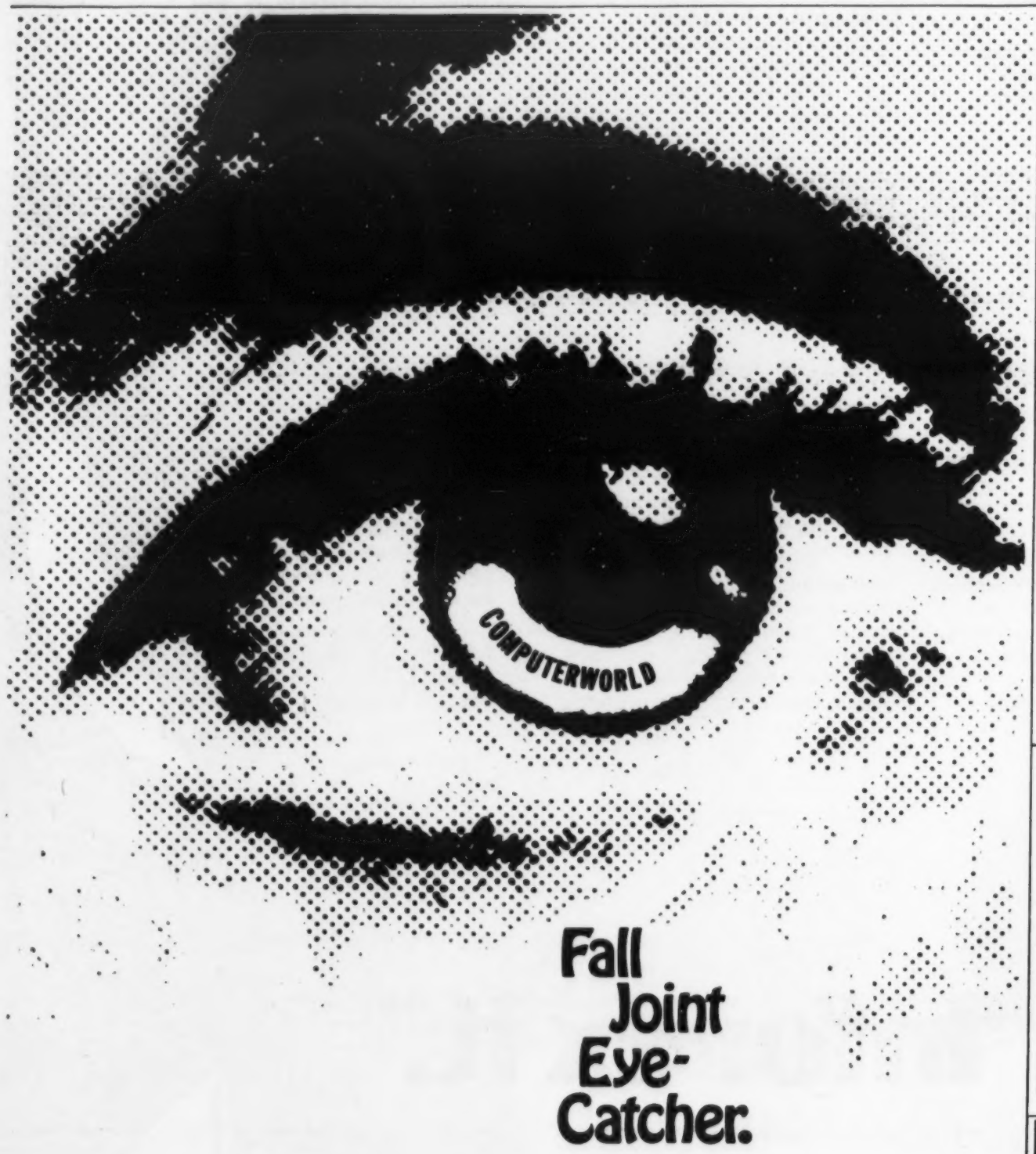
ANN ARBOR, Mich. – Insta-Tax 70 can be used by professional tax accountants to generate individual federal income tax returns, through any of three time-sharing networks.

According to Shared Applications Inc., the developer, the service is available on GE's Mark I and Leasco's Hewlett Packard and 360/Response services and on the International Telecomputer Network, all of which are headquartered in Bethesda, Maryland.

Leasco said that its Hewlett-Packard service is geared to processing the standard return and the most common schedules, for a flat $18/hr for machine time. The 360/Response service, the company, can handle all schedules, and costs $30/hr. These prices, according to a spokesman, are subject to a monthly minimum of $100. Users are also subject to a $250 initiation fee, he added.

Service under GE's Mark I service and under ITN is expected to be available at standard rates.

Shared Applications is at 213 E. Washington St.



Fall Joint Eye-Catcher.

This is the last chance to get the attention you deserve at FJCC.

Nov. 18th Show Issue.
B-&-W forms close Nov. 6

We'll be distributing 10,000 bonus copies of our special FJCC issues at our own booth. So you won't be lost in the crowd. Or lose your prospective customers on the floor.

COMPUTERWORLD (617) 332-5606

Keypunching

- Prompt service
- No job too large
- Quality guaranteed
- Pick-up + delivery service
- Prices exceptionally competitive

Philadelphia (215) WA 3-1930
New York City (212) 565-3374
Fimaco, inc.
230 W. Washington Sq.
Philadelphia, Pa. 19106

NEED EXTRA STORAGE CAPACITY?
(Especially Burroughs 5500 Users)
EMR Computer has the following units for sale: Burroughs (B-475) 60 megabit disk file – $42,000. Requires Burroughs (B-471) electronics unit – $31,000. Electronics unit can handle up to five storage units providing 300 megabits of storage. Average access time: 20 milliseconds. For further information call or write:
Tom Dickmeyer
EMR COMPUTER
8001 Bloomington Freeway
Minneapolis, Minn. 55420
Phone: (612) 888-9581 Ext. 435

Just a second.

If you're spending over 4K monthly on time sharing, you can afford this second computer.

Get in-house installation of the CCS 2100 for more dedicated inquiry.

Here's what's in it for you:

A Second System—The CCS 2100 means that you can have real-time computing without slowing down the processing on your main computer system.

Fixed Costs—The CCS 2100 Time Sharing System provides far better cost control than outside service costs which are usually uncontrollable.

Better Performance—The CCS 2100 Time Sharing System will handle up to 16 terminals simultaneously with up to 60 million bytes of on-line data storage. Conversational time sharing, dedicated inquiry or real time business data processing can all be handled well by this efficient system.

Lower Cost—The CCS 2100 costs less to lease or buy out-right than to upgrade your present business computer for communications processing. Unattended operation means no extra operators or maintenance staff. The CCS 2100 runs by itself.

Powerful Library and Software—The CCS 2100 is available with a library of programs, and the powerful Extended BASIC Language. Business packages for inventory reporting, budgeting and cost control are all part of the software package.

Isn't it time you had second thoughts?

BOSTON
235 Wyman Street
Waltham
Massachusetts
02154
617-891-0210

TORONTO, CANADA
48 Yonge Street
Toronto, Ontario
416-366-7643

LONDON, ENGLAND
Northdale House
North Circular Road
London N.W. 10,
England

Expect more from
CONSOLIDATED COMPUTER
makers of the famous Key-Edit

Chicago Cleveland Detroit Los Angeles New York Philadelphia San Francisco Washington, D.C. Ottawa Montreal

Infrared Units Used for Short-Haul Data Transmission

By Don Leavitt
CW Staff Writer

Although still in the experimental stage optical transmission systems are being tested at various user's sites to determine their value in computer data networks.

Using the light spectrum rather than either microwave frequencies or hard-wired cables, infrared optical systems for transmitting digital data generally operate well in metropolitan areas where transmission distances are short and alternative microwave frequencies are crowded.

Limited to line-of-sight distances, infrared does present unusual problems for the user. Both users and manufacturers have told CW that heavy snow can affect transmission quality. Fog and rain apparently do not. But a bird or other object, flying or falling through the transmitting path, can interrupt the flow of data.

Computer Transmission Corp. of Los Angeles has had its Optran infrared system available since last spring. This system operates at speeds from 1.2 to 50K bits/sec and has a transmission range up to one mile in clear weather.

By next January, University Instruments Corp. in Boulder, Colorado, will be delivering its OCL-300 system. As with the Optran unit, the OCL-300 uses lenses rather than lasar technology to concentrate its signal. The signal has a tendency to spread as distance increases, but the company claims that the OCL-300 has a transmission range of up to 8 miles in clear weather, and up to one kilometer in the worst weather. The device is said to transmit data at 50K bits/sec.

Communications

Both MCI and Datran are continuing tests related to using infrared transmission units in their proposed special purpose data networks.

Datran has inserted a half-mile link based on the Optran system in an otherwise cable-based line between a remote batch terminal in Virginia and a computer in New Jersey. Datran said that it is extremely pleased with the results of the tests to date.

Also pleased with infrared data transmission via Optran units is the University of Southern California. In Los Angeles, USC has tied together a 360/65 and a 360/44 in another building half-a-mile away from the first. The only problem USC had with the link-up had nothing to do with the Optran units, but concerned modifications that had to be made in the IBM supplied software, to modify the Model 44 into a remote batch "terminal," a spokesman told CW.

Both USC and Datran commented on the flexibility of installation of infrared systems. As long as he has line-of-sight between the units, the user can install them anywhere he wishes; although the infrared beam generates radiation hazards which could injure persons. Beyond that, the system can be used where cable installations would be prohibitive.

A non-regulated communications medium, infrared systems can be installed without the approval of the FCC.

Half of Satellite Circuits Proposed For Data by Bell

WASHINGTON, D.C. – American Telephone and Telegraph Co. recently became the second carrier to announce plans for a domestic satellite system. Western Union had previously released details of a proposed system.

AT&T has committed itself to assigning half of the circuits on its proposed primary satellite to handle data transmission and Picturephone calls. The other circuits would be assigned to telephone calls.

In filing its application with the FCC, AT&T said that its completed system would include two 10,800-circuit satellites in geostationary orbits and five earth stations. The system would be used as an integral part of the Bell System's nationwide communications network and would carry long distance telephone and Picturephone calls, data services and occasional television programming.

AT&T said that it expects to transmit in the 4GHz and 6GHz frequency bands now authorized. However the satellites will include low-power beacons operating in "much higher bands" for experimental purposes. The carrier said that it plans to do this in response to the FCC's invitation for satellite systems using high band frequencies.

In a related move, Datran has decided against filing an application for a satellite system. Datran said that market research had shown that satellite systems would not be economically feasible "for some years to come."

MCI Prods FCC for Final OK on Data Link Changes

WASHINGTON, D.C. – Microwave Communications Inc. (MCI) last week continued its efforts to get its already-authorized Chicago-St. Louis communications link "up and running".

MCI has said that it would pay for changes in a microwave station operated by General Telephone of Illinois (GTI) in order to avoid any possibility of radio interference with the MCI system.

The FCC's Common Carrier Bureau has proposed the substitution of an antenna on the station and MCI agreed with the Bureau's plan.

MCI also commented formally on the Western Union proposal for a 'hybrid' extension to its national radio beam system. The firm urged the FCC to act on the minor modifications needed to the authorized MCI route, before it took time to consider WU's completely new route request.

Singer Modem Series is Compatible With WE 103

WOODBURY, N.Y. – Compatible with the Western Electric 103 A and F data sets, the 883 series of modems from Tele-Signal Corp., a Singer subsidiary, perform all requisite handshaking procedures.

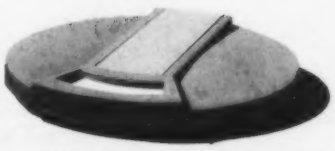
Models are available for either dial-up service or private lines, operating at 300 bits/sec. The units can be supplied as either stand-alone units or card assemblies for OEM's.

Tele-Signal Corp. is at 250 Crossways Park Drive.

NOW AVAILABLE:
instant data storage systems for most minicomputers.

To a minicomputer an "instant" IODISC* Series 1000 is the same as a 180-day data storage system. But to you an "instant" IODISC Series 1000 is better because it can be delivered, completely interfaced, in as little as 10 days, with normal delivery ranging from 20 to 60 days.

Series 1000 data storage systems can be attached to almost any small computer because of the unique capabilities of the IODISC controller. An integral IODISC adapter permits direct attachment to the CPU.

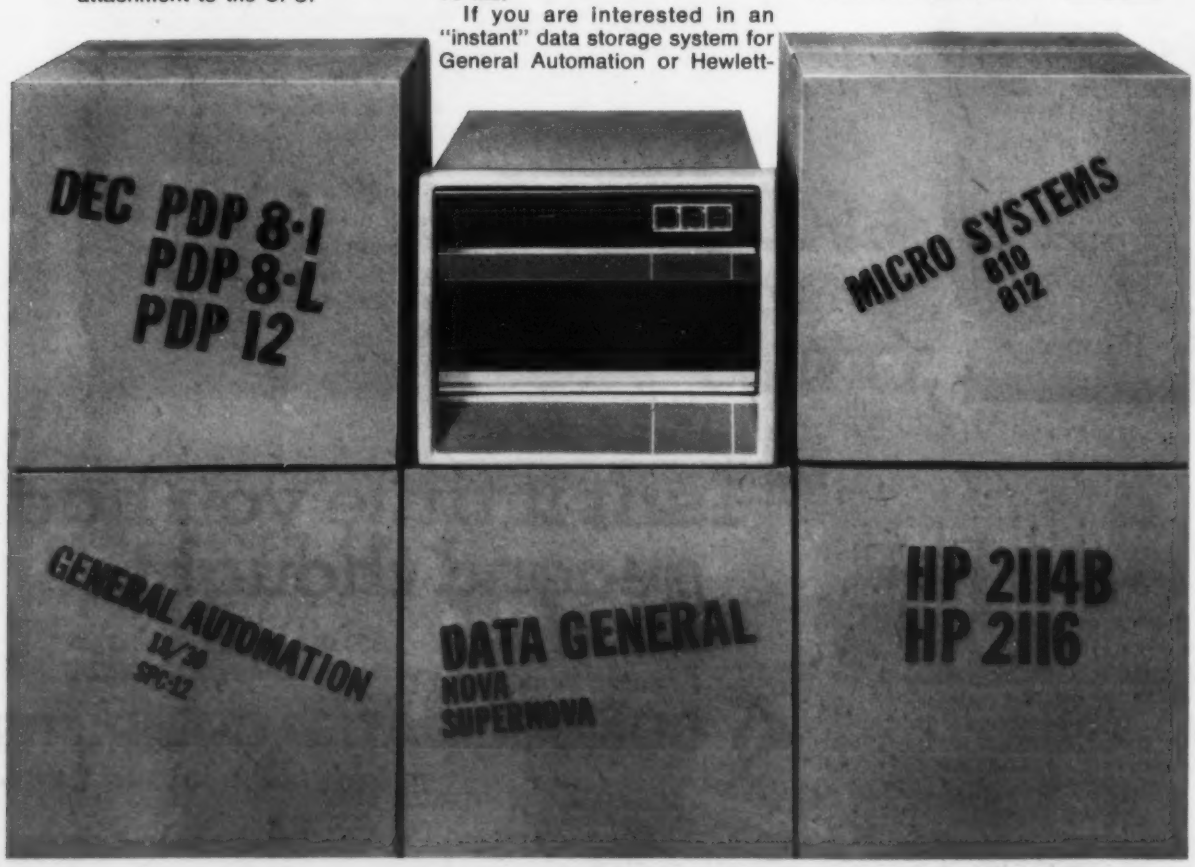


IODISC Series 1000 data storage systems are available as five separate models. With either single-disc removable cartridges or combinations of cartridges and fixed discs. Capacities range from 11 to 44 megabits. Average access times are between 60 and 70 ms.

If you are interested in an "instant" data storage system for General Automation or Hewlett-Packard minicomputers, contact these manufacturers directly. For other minis contact either the manufacturer or IOMEC, INC. For more information about IODISC Series 1000, write: Iomec, Inc., 345 Mathew Street, Santa Clara, California 95050. (408) 246-2950.

iomec inc

* A Trademark of IOMEC, INC.



Telex 5403 Train Printer Is IBM 1403-Compatible

TULSA, Okla. – Users with 360 installations now have available a train printer from Telex, the 5403, that offers compatibility with the widely installed 1403 N1 IBM unit. Telex says the 5403 has 10% better performance at 20% lower prices.

Compared with the 1403-N1's rated speed of 1,100 line/min, the 5403 can attain a rate of 1,200 line/min, according to Telex. With a 36-character set, a speed of 1,500 line/min can be attained on a continuous basis. A burst mode capability allows a 16-character set equipped printer to print at 2,500 line/min for periods of several minutes.

For 360 and 370 Models

The Model 5403 is both hardware and software compatible with all IBM System 360 models 25 through 195, plus the announced 370 models.

The printer is designed by Telex to operate with the company's 5821 Printer Control. This unit, Telex said, allows the off-line or concurrent on-line/off-line operation of attached printers.

The 5821 is a microprogrammed system with its own buffered core storage.

The device can control up to three printers and one IBM 2540 card reader/punch. An interface to allow the unit to control tape drives is available.

Diagnostics Included

Microprogrammed diagnostics are included in the controller, allowing the operator to perform fault isolation and initiate correction procedures without the use of the computer, Telex said.

Telex has not announced prices beyond indicating that purchase prices would be 20% below IBM prices, while rental systems would offer the user savings of greater than 12%. Based on IBM's prices for the 1403-N1, 2821 Model 1 Control Unit with 3615 1,100 line/min printer adapter, and 1416 interchangeable print cartridge, the Telex printer and controller is expected to lease for about $1,800/mo and sell for approximately $72,000.

Initial deliveries are scheduled for May 1971.

Controller Lets Minicomputers Use Bryant Disk and Drum Storage Units

WALLED LAKE, Mich. – A peripheral controller from Bryant Computer products will enable minicomputer users to attach up to eight Bryant disk and/or drum devices to their minis.

In addition, the storage devices can be on-line to two dissimilar minis through the Series 720 Mini-Controller.

The first units will be available, Bryant said, with interfaces to suit the DEC PDP-8, Lockheed MAC-16, SEL-810, and Interdata computers.

The system, including minis, controllers, and storage devices, could be used as a programmable data retrieval facility when connected to a large general-purpose computer, providing a data base with as much as 32-billion bits in directly accessible storage.

Devices that can be attached to the Model 720 include head-per-track drums, 2311-compatible disk files and large-capacity fixed-disk units.

The minicontroller is composed of two sections, a basic control section that performs the general functions of the device, and a subchannel section to control functions that are unique to a particular storage device. Subchannels are developed for each type of storage device.

Storage Devices

Two medium access time, positioning-head, disk drives can be used, the Bryant 1100 Disk storage drive and the Series 4000 Disk Files.

The 1100 is compatible with the IBM 2311 in function, interface and performance.

The Series 4000 fixed-disk files are offered modularly expandable in single data disk increments to the 26-disk maximum. Each disk has a capacity of 175-million bits of data, giving a device capacity of 4.38-billion bits. Access time (including positioning, latency, and verification) ranges from 100 to 265 msec.

Faster access times, and smaller capacities, are available with Bryant's head-per-track drums.

The prices of the 720 Series Mini-Controller range from $5,000 to $10,000, depending on configuration. Initial deliveries are scheduled for the first quarter of 1971.

Bryant Computer Products is at 850 Ladd Rd.

IRS Picks Brookhaven

BROOKHAVEN, N.Y. – Town officials have received notification from the General Service Administration that the IRS intends to build a DP center here.

The opening date is projected for the summer of 1972.

Mini/Max Computer From Infotronics Is Aimed at Real-Time Applications

AUSTIN, Texas – A 16-bit small computer, the mini/max,, described by the manufacturer, Infotronics, as having more architectural strength than most minis, is said to be uniquely suited to real-time applications.

The mini/max system offers up to 16 priority DMA channels, 256 priority and control interrupt channels, and a real-time executive program.

The computer is equipped with 4K to 65K words of core memory, with a cycle time of one μsec. Sixteen internally addressable registers are provided, offering flexibility in writing reentrant code, according to the company. Operands can be addressed in four modes, direct, indirect, double indirect, and relative.

Mainframe options include controllers for paper tape and punched card equipment, teletypewriters, and printers. A real-time clock, memory parity, memory protect, hardware multiply/divide, floating point and power/failure recovery are other options.

A variety of peripherals are available for use with the mini/max. They include card readers and punches, paper tape readers and punches, line printer, Models 33 and 35 Teletypes, and a CRT.

Seven- and nine-track magnetic tape drives are available, as is a 256K word disk memory and controller.

The price of the mini/max, in its minimum configuration, including 4K of memory, control console, and power supply is $12,900.

Infotronics Corp. is at 8500 Cameron Rd.

Republic Pencil-Mark Reader Cuts Handling

EL SEGUNDO, Calif. – Claimed to be the only reader capable of reading pencil marks on both sides of a tab card simultaneously, an optical device from Republic Information Systems can process punched cards at 200 card/min.

The reader makes it possible, the company said, to use formats that store data on both sides of the card. This technique, already in use in the preparation of telephone company toll tickets, can reduce by up to one-half the number of cards handled and stored.

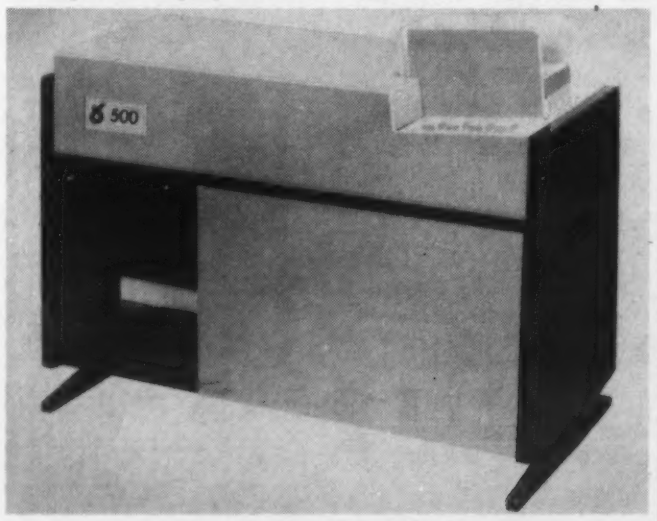
Timing for mark reading is accomplished with internal strobing, eliminating the need for timing marks on cards, the company said, permitting greater versatility in card design.

Typical cards used in the Series 500 Easy Reader are 12-row, 40-column.

The Series 500 readers are available in models offering read speeds of 10, 15, 30, 105 char/sec and 200 card/min. Variations that read pencil marks only and keypunch only are also available.

Prices range from $3,000 to $5,500. An interface to connect the reader to a data set is priced at .$250. The company also offers an interface to an IBM 360/30 at a price of $5,600. The current delivery schedule is 45 to 60 days.

Republic Information Systems is at 950 N. Sepulveda Blvd.



Republic Optical Card Reader

WANTED Working Capital

Eastern Mass computer service bureau . . Profitable first year . . six figure sales . . Computer on site . . Untapped market area . . Will discuss investors, merger, acquisition.

Reply Box 3263
Computerworld
60 Austin Street
Newton, Mass. 02160

HOW do things look for the computer industry as the pause in growth apparently is ending?

The current "Gray Sheet" -- a Midyear Review -- examines the status of each major mainframe supplier and all industry segments. Send for the current issue -- $8. Or, go ahead. A year's supply only costs $75.

EDP industry report

Department N-20
60 Austin Street
Newtonville, Mass. 02160
617-969-4020

SELLING LEASING

DATA AUTOMATION SERVICES, INC.

4858 CASH ROAD
DALLAS, TEXAS 75247

HOME OFFICE: (214) 637-6570

316 West 28th Street, Los Angeles, Cal. 90007, (213) 747-0587
7790 N.W. 7th Ave., Miami, Fla. 33150, (305) 693-3911
1850 DeKalb Ave. N.E., Atlanta, Ga. 30307, (404) 377-3962
6366 Gross Point Rd., Niles, Illinois 60648, (312) 647-0166

SYSTEM 2100
Sophisticated Multi-Key Board → Disc → Tape Input System
Lease/Sell

360/1401 COMPUTERS
Sale-Purchase-Lease
Systems wanted now or will purchase leaseback until your release date
All Model 1401s/360s available for sale or lease

UNIT RECORD EQUIPMENT
Buy/Sell/Lease

024	026	082	083	084
085	087	088	402	403
407	514	519	552	602

ALL WITH IBM M/A
(also 7330, 1311, 729 drives)

DAS
DATA AUTOMATION SERVICES INC

Low Cost Off-Line System Can Read Any OCR Font

HORSHAM, Pa. – An optical character recognition system from OCR Systems, Inc. uses a stored program to teach the device to recognize any OCR font, plus handprint.

The OCR System 1000 is a low-cost unit that is said to offer high performance, and user-oriented features at a price less than half that of competitive systems, such as the Scan Optics IC/20, Recognition Equipment Retina, or Scan-Data 250/350.

Initially, the system will offer full alphanumeric OCR-A, OCR-B, Farrington 7B, 1428, 407, mark read, and numerics handprint. Other fonts and extended character sets will be added on request, the company said. The number of fonts that are available concurrently depends on the amount of core storage available.

The user defines each field, in a maximum of three lines per document, in terms of the fonts to be read. Fonts can be intermixed on one document.

Documents may range in size from 2.6 in. by 3.5 in. to a maximum of 8.5 in. by 12 in. Throughput may be as high as 500 document/min.

Output is written onto 7- or 9-track 800 bit/in. IBM-compatible tape. Other output media such as cards, paper tape, bulk storage devices, or on-line operation to an IBM 360 can be provided, the company said.

A user-oriented feature, Document Referral, is claimed to be the only character/field insertion scheme for exception processing whereby the document stops in front of the operator and the field is displayed on a CRT for keyboard correction.

The System 1000 consists of a transport/scanner and a mainframe which is a Varian 620/i computer with a minimum of 4K of memory (up to 32K is available). Also included in the mainframe are the recognition logic, a buffer memory, a magnetic tape unit or other output device, and a Teletype Model 33 or 35.

The transport/scanner is a desk-sized unit containing the document transport, one or more scan units, a CRT display, and a keyboard.

An operating system and applications software are provided. The operating system performs transport control, scanning, operation of the CRT display and the keyboard, and character recognition.

A stand-alone system with 4K of memory and magnetic tape output is priced at approximately $69,000. First delivery is scheduled for the first quarter of 1971.

OCR Systems, Inc. is at 328 Maple Ave.

Memory Offers Fast Access

WOODLAND HILLS, Calif. – With cycle times as high as two μsec, a mass core memory system from Data Products, Systems Division, is designed to replace or augment the IBM 2361 Large Capacity core storage unit.

Intended for use with the 360 models 50, 65, 67, or 75, the System 6000 Large Core Store can operate as a replacement or extension of main memory, of as a substitute for the 2361. The Data Products unit is said to be completely compatible, hardware and software, with the IBM devices.

400% Faster

The company claims to offer performance increases up to 400% at a 20% lower price, than the 2361.

Memory comes in basic capacities of 1- or 2-megabytes. Up to four units can be connected in parallel to provide a maximum of 8-megabytes of storage.

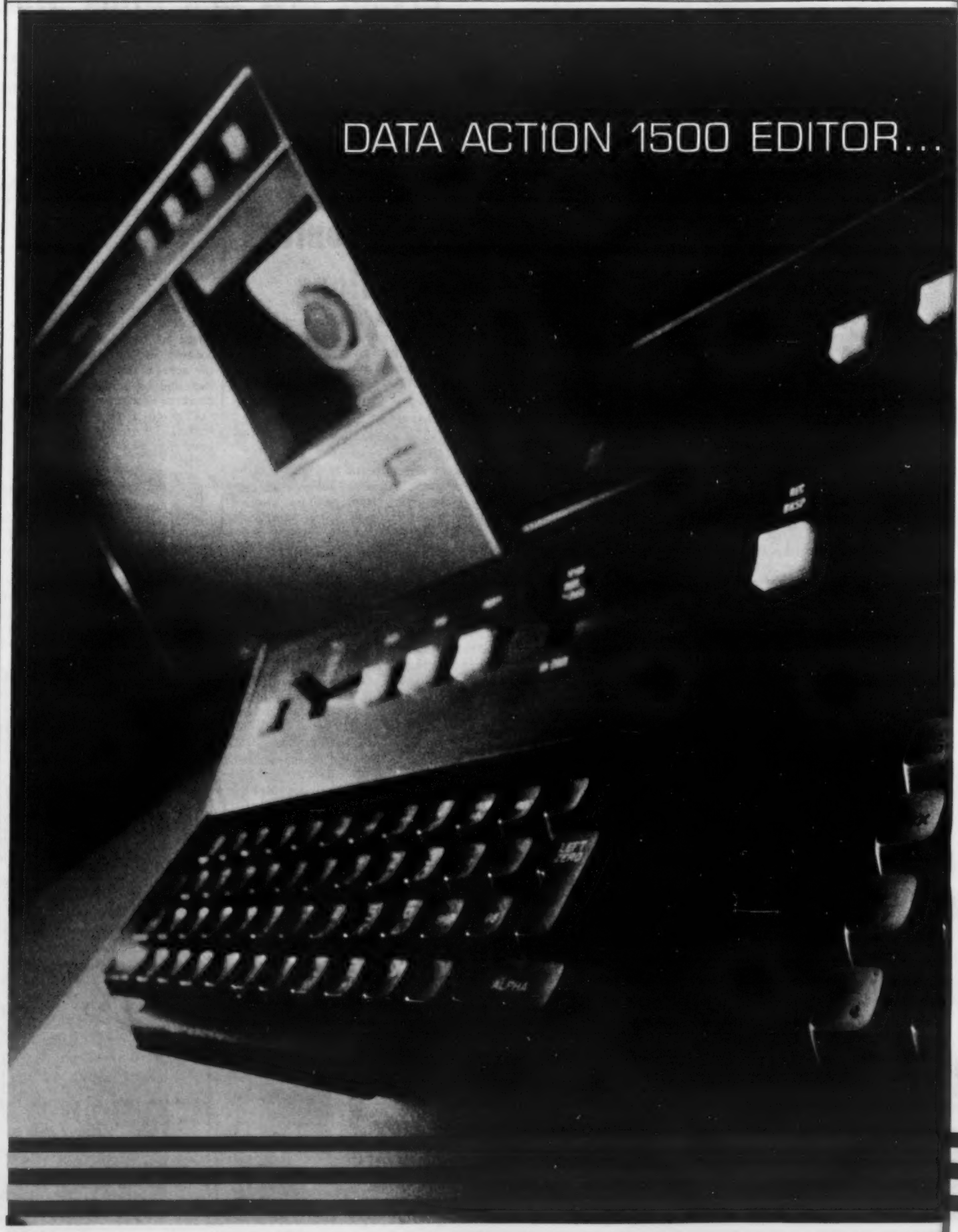
Storage protection and fetch protection are standard. A shared storage feature that provides for the simultaneous use of one or more System/6000 units by two CPUs is available. Either CPU may read or write data into one core store, but not simultaneously. A priority system prohibits the access from more than one CPU during a memory cycle in process.

The cycle time of the Data Products device depends on the CPU. With the 360/50, the cycle time is 4 μsec, while with the 65, 67, and 75 the cycle time is 2 μsec.

Prices

Price for the one-megabyte unit is $244,150 plus $375/mo maintenance. On a one-year lease the cost is $5,425/mo. The two-megabyte memory sells for $407,400 plus $575/mo for maintenance, and leases for $9,065 per month. Lease prices do not include maintenance. The memory systems are available on a six-month delivery.

Data Products, Systems Division is at 6219 DeSoto Ave.



CAPITAL AVAILABLE
FOR EXPANSION
OR START UP
Experts will advise and place your $$ requirements through private or public means. All information is treated confidentially and sent to:
James Quigley, President
National Science
& Technology Co.
1 East 42nd Street
New York, N.Y. 10017
(212) 687-2570

COMPUTERWORLD

societies

McAfee Assistant to Asis Head

WASHINGTON, D.C. – Robert McAfee Jr. has been appointed assistant to the executive director of the American Society for Information Science (Asis).

For the past four-and-one-half years he was with the American Geological Institute, Washington, D.C., as project manager and managing editor of the revised edition of the AGI Glossary of Geology.

The Society, now in its 33d year of operation, is an association of over 3,500 professionals in the areas of research and application

Designer's Conference Set for Jan. 19

ANAHEIM, Calif. – The Computer Designer's Conference and Exhibition, Jan. 19-21, will concentrate exclusively on the needs of the engineers and specialists who design computers, equipment, and systems.

Every facet of the event, from the technical program to the exhibits, will deal exclusively with the practical aspects of computer design of solving day-to-day design problems and of keeping abreast of the state-of-the-art in computer design.

This conference, to be held at the Anaheim Convention Center, will gather together engineers who design, build, and test computer equipment and systems, not only for the technical program but to see the newest components, subsystems, and test equipment used in constructing computers.

This is intended as a selling show, according to the sponsor, Industrial & Scientific Conference Management, Inc.

Call for Papers

THIRD ANNUAL ACM SYMPOSIUM ON THEORY OF COMPUTING, Shaker Heights, Ohio, May 3-5, 1971.

Papers describing original research into the formal analysis of computing problems are being sought. Authors are requested to send six copies of an extended (about five pages) abstract by Dec. 1, 1970 to Dr. Philip M. Lewis, G.E. Research and Advanced Development Center, Schenectady, N.Y. 12305.

Copies of final papers are due March 1, 1971 for inclusion in the symposium proceedings.

1971 SUMMER COMPUTER SIMULATION CONFERENCE, Boston, Mass., July 19-21.

Papers should stress the conceptual aspects of computer simulation with emphasis on the communication of central ideas through familiar examples.

The session on Principles of Computer Simulation covers the topics of languages, techniques, and numerical methods. Abstracts are due Nov. 30, to Young Ju Lee, Programming Sciences Corp., 1900 Avenue of the Stars, Los Angeles, Calif. 90067. Complete manuscripts are due March 31, 1971.

For informtaion concerning other topics, write the general chairman, Takeshi Utsumi, Stone & Webster Corp., P.O. Box 2325, Boston, Mass. 02107.

DEC Users to Meet

MAYNARD, Mass. – The Digital Equipment Computer Users Society (Decus) has announced its session topic areas for its fall meeting, at the Shamrock Hilton hotel in Houston, Texas, Nov. 19-21.

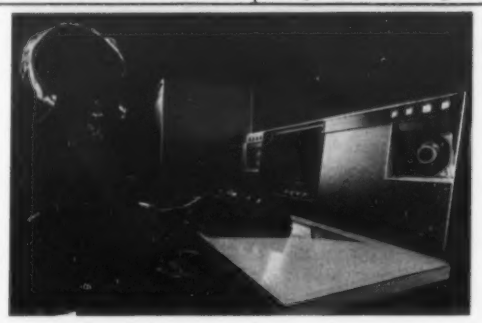
The proposed technical session titles will include astronomy and space, analytical instrumentation, computer graphics, education, interactive computer systems, physics (both nuclear and general), and biomedicine.

Originally attended only by Decus members, the semiannual meetings are now open to all interested parties.

California County DPs Schedule 23d Meeting

LOS ANGELES – The 23rd CACDP (California Association of County Data Processors) conference will be held in Monterey at the Mark Thomas Inn, Nov. 19-21. Topics to be covered include management of data processing as it relates to physical and file security, interfacing with state level projects, and system exchange among counties.

...CORE OF A COMPLETE OFF-LINE SYSTEM, FROM SOURCE DOCUMENTS THROUGH COMPUTER-READY DATA.



Complete off-line data editing, validation, and output tape generation are capabilities of the new 1500 Editor.

Data validation performed by one operator on the Editor eliminates the expense and time involved in manual key verification. Far greater speed and accuracy is achieved.

By taking the validation routine off the main computer, where every second is important, the computer can be used for the more productive projects it was intended for. Computer scheduling is simplified.

The Editor handles all the editing functions performed on the main computer. One easily prepared edit routine is prepared for each input job and stored on tape for use at any time.

Many of the common forms of record editing such as data duplication, field resequencing, batch totals, and use of check digits are carried out.

In addition, the Editor performs complex specialized procedures . . . table look-ups—field comparisons—field content checks—multiple verification—conditional verification . . . and many other critical routines that until now have not been available on any input system.

Data can be keyed in the form it appears on the document; the Editor puts it into the format you need.

Error correction can be made on-line using the CRT display and keyboard. Or a low-speed printer can be used to list exceptions for correction on a data entry unit.

The Editor can be used strictly to validate input data—or it can also output computer-ready data on 7 or 9 track compatible tape.

An efficient, simple system, easy to learn and operate—the Editor has a standard Data Action Inscriber keyboard, identical in layout to keypunch machines.

When combined with a Data Action entry unit, the Editor becomes the core of a complete, automatic off-line input system—the most advanced development today in data preparation and input.

For complete information on the Editor and on the Data Action Input System, contact your nearest Data Action sales office.

Or write: DATA ACTION, Dept. A-7070
4445 West 77th St., Minneapolis, Minn. 55435
Phone: 612/920-9200.

DATA ACTION
THE INPUT COMPANY

CONVERSION PROBLEMS?
TAPE TO TAPE
Tape to non-compatible peripherals
SCI 761 series converts off line;
9 TRACK – 7 TRACK
7 TRACK – 9 TRACK
1600/800BPI-556BPI
761 enables direct operation of off line devices with non-compatible tape drives
Systems Concepts, Inc.
Whitestone New York
(212) 353-5000

Nothing's as dead as yesterday's news.

If you're reading someone else's five-day old Computerworld each week, you're defeating our entire purpose in life: to bring you all the news of the computer field as it happens. Not a month later. In fact, we're the only publication that does this . . . the only weekly for the EDP field. But you know a lot about us already. After all, you're reading Computerworld right now.

News fades quickly in the fast-moving computer industry. And a fresh issue of Computerworld delivered directly to you each week will help make you more efficient. All for only 17.3¢ per issue with a one year subscription. Do us both some good. Fill out the coupon below. If you're an employer, attach your Computerworld routing list. We'll see that everyone on the list gets a wrap-up of the news while it's still alive each week.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Please send me *Computerworld* for:

☐ 1 year – $9* ☐ Payment enclosed
☐ 3 years – $20* ☐ Bill me

*Add $1 per year for Canada; $4.50 per year for other Foreign
Foreign air mail rates sent on request

First Initial | Middle Initial | Surname

Your Title | 80285a

Company Name

Send to: Address

City | State | Zip Code

Address shown is: ☐ Business ☐ Home

COMPUTERWORLD Circulation Department
797 Washington St., Newton, Mass. 02160

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

YOUR INDUSTRY
01 Mining/Construction
02 Manufacturing (computer or data system)
03 Manufacturing (other)
04 Utility/Transportation
05 Wholesale/Retail
06 Finance/Insurance
07 Consultants/DP Services
08 Business Services (except DP)
09 Education/Medical/Legal
10 Government/Military
12 Communications/Printing/Publishing
13 Other:

YOUR TITLE OR FUNCTION
01 Operational Management (nonengineering)
02 Computer Professional Staff
03 Corporate Officer
04 Engineering Management
05 Engineering/Scientific/R&D
06 Production/Maintenance
07 Sales/Marketing
08 Librarian/Educator
09 Other:

Leasco to Unveil Systems, OS Instruction Programs

CW Midwest Bureau

OAKBROOK, Ill. – Leasco Systems Corp. has completed the development of an instructional program in systems management which is now undergoing validation and one program in OS, which is about to be placed in validation, according to company officials.

Another program on entry is about to be completed, Leasco said.

According to Kenneth B. Johnston, Leasco Systems vice-president, the programs were developed and produced by a Leasco in-house staff of writers, educators, and production technicians led by Mrs. Shannon R. Fischer who, before joining Leasco, has served as a consultant in data processing and authored a text on education in EDP.

Education

While no formal introduction has yet been made of the products, Dwight Walton, general sales manager, said the programs would be introduced to the marketplace by mid-November.

The design criteria for the new instructional programs, Johnston explained, were predicated upon four factors.

First, Johnston said, was the availability of the student. The programs were designed to allow a student, the employee of the company purchasing the training programs, to take the courses in his less-productive hours of company time.

Second, Johnston said, was the elimination of redundant training so that the time a student spends on the course is cost effective for the student's employer.

Third, the programs are paced to the student's attainment level, allowing the student to control the speed at which the course material is presented, allowing, in turn, a better opportunity for the student to understand the material and perform the skills which are the course's objectives.

And finally, Johnston said, the organization of the materials to the needs of the student in relation to his job, which allows the student to control the depth of the material being presented to him.

Position Announcements

WANTED
Sales Representative NYC
To offer/ sell our EDP Services
Accounts Payable
Accounts Receivable
Payroll
Compensation:
Commission/Salary
Write CW Box 3269
60 Austin St., Newton, Ma.

FOR SALE
188 ALPHA COLLATOR
407-A3
024's
056's
026's
CORPORATE COMPUTERS, INC.
310 Madison Ave.
New York, N.Y. 10017
(212) 867-0664

2540
For Sale
2540 for sale
for immediate delivery.
$25,000.
IPS INFORMATION PROCESSING SYSTEMS, INC.
(201) 871-4200
467 Sylvan Avenue
Englewood Cliffs, N.J. 07632

PROGRAMMER ANALYSTS
Collins & Aikman Corp. offers you
- Excellent growth history & future
- Top salary & fringes
- Brand new facilities next to the University of North Carolina, Charlotte – Spearhead of the Sunny South.
- Company-paid insurance – life, hospitalization, surgical, major medical
- Company-funded profit-sharing & pension
- Opportunity to work with a team of experts developing mgmt. info. systems at divisional and corporate levels.
- 360-40 disk oriented multi-partition system using OS & MFT-2 with COBOL as primary language.

Reply in confidence to:
Manager of Recruiting
Collins & Aikman Corporation
P.O. Box 1599
Charlotte, N.C. 28201
an equal opportunity employer

PRICES SLASHED!
LARGE SELECTION
IBM 403, 402 & 407
ALL MODELS
PROMPT DELIVERY
– ALSO –
024, 026, 029, 047, 056
059, 082, 083, 084, 085
087, 514, 519, 552, 803
- DISC DRIVES
- TAPE DRIVES
- 360 SYSTEMS

I.O.A. DATA CORP.
383 Lafayette St., NYC 10003
(212) 673-9300, Ext 10

WE BUY AND SELL
■ PUNCHED CARD EQUIPMENT
■ COMPUTERS ALL MODELS
CALL OR WRITE TODAY
CAC P. O. BOX 29185 ATLANTA, GA. 30329
TELEPHONE (404) 458-4425

FOR SALE
U/R Parts
Features
Sub-Assemblies
- Fast shipment
- Comprehensive line
- Custom plus standard items
- Attractive prices

Write for detailed price brochure or call Henry Garcia collect.
(215) 265-6700 Ext. 261
MAI
Service Division
875 First Avenue
King of Prussia, Pa. 19406

CFI
FOR SALE
360/30 CPU 32K 49%
IBM 64K CORE 2040 GF 82%
2314-1 70%
029/059 Avail. Nov. 1
Lease Terms Available
TO PURCHASE
360/30 CPU 32K 49%
360/40 CPU 128K
2803-2
2821-1
Call or Write
COMPUTER FINANCIAL, INC.
John Detrick
1111 Wilshire Boulevard
Los Angeles, California 90017
(213) 481-2287

FOR SALE
20 IBM
Data Cells
201 743-4570
Anta Corporation

Buy Sell Swap

FOR LEASE
(5) IBM 2311
Model 1
Disk Storage Drive
$375 Each, per month
Please call:
312-852-1308

FOR SALE OR SUBLEASE
IBM MODEL 20 2020-8K
With 2203 Printer
and 2560 MFCM
$50,000 Purchase Price
Reply to:
CW box 3273
60 Austin Street
Newton, Mass. 02160

FOR LEASE
360/30 65K Now
360/30 65K Feb. '71
360/40 128K Feb. '71
Also: 2841's Now
2311's Now
2402-5's Now
2401-3's Dec.
Box 3274
60 Austin Street
Newton, Mass. 02160 or
914-428-3804

ECS
Executive Computer Systems
800 Enterprise Drive
Oakbrook, Illinois 60521
312-325-6363
FOR LEASE
– IBM 360/30-32K Systems
3 Available
– IBM 1240 Banking System
– IBM 2841
FOR SALE OR LEASE
– Tally 128B Systems
– Tally 228 Systems
– Frieden AP-5
BEST OFFER
WANTED TO LEASE
-ECS is interested in all IBM systems and peripherals available for lease. If you are interested in leasing your owned equipment please contact us.
A VIATRON DEALER

SALE
IBM 1401 E5
4 Tapes
[has punch-feed-read; print storage features]
High-Quality IBM Unit Record Machines
M/A & Recon.
COMPUTER RESALE EXCHANGE, INC.
1525 N. H. Ave., N.W.
Washington, D.C.
(202) 265-1550

FOR SALE
IBM 2841
Disk Storage Control Unit
2 Channel Switch Feature
Immediate Availability
- IBM New Price – $29,630
- Our Price – Under $10,000

Contact:
Lunceford & Associates
Accountants Building
5909 Martway
Mission, Kansas 66202
913/381-7272

WANTED
360/40 G
On three year firm lease
Reply to:
Box 3271
60 Austin Street
Newton, Mass. 02160

SALE
1401/729 Tape System
4,000 CORE Positions
1402 and 1403
Sell for less than $28,000
Will lease for $1,100/month
summit COMPUTER CORPORATION
785 Springfield Avenue
Summit, New Jersey 07901
(201) 273-6900

BUY-SELL-LEASE
All Types
IBM
Computers
&
Unit Record
THOMAS COMPUTER CORPORATION
32 N. CLINTON
CHICAGO, ILL. 60606
(312) 829-7300

WANT TO LEASE
1403 MOD 2
and 2821 MOD 1 or 2
WANT TO BUY
029, 024's, 026's
056's, 548, 082
EQUIPMENT MUST BE ACCEPTABLE FOR MANTENANCE AGREEMENT
Write: Box 3270
60 Austin Street
Newton, Mass. 02160

FOR SALE
CDC 160-A
3 TAPES-LINE PRINTER
UNDER 30K
ALSO
ENGINEERING COMPUTER SYSTEMS

LGP-21	12K
RPC-4000	16K
LGP-30	5K

VALLEY COMPUTER CORPORATION
17027 ROSCOE BLVD.
NORTHRIDGE, CALIFORNIA
213-881-5020

FOR SALE

IBM	MODEL	SERIAL #
1401	E4	29780
1402	1	26255
1406	1	12874

PRICE: $18,000
Please call:
312-852-1308

Buy Sell Swap

ACS
SALE OR LEASE
80K 7080 System
8K 1440 2 Disk System
(Financing Available)
12 or 16K 1401 System
7330 & 729 Tape Drives
16K 1406 Core Box
All equipment on M/A
F.O.B. Houston, Immediate
ACS Equipment Corporation
8928 Spring Branch Drive
Houston, Texas 77055 (713) 468-4301

BUY-SELL-LEASE
ALL TYPES
DATA
PROCESSING
EQUIPMENT
COMPUTER DISCOUNT CORP
2400 E. Devon Ave.
Des Plaines, Ill. 60018
(312) 297-3640

SAVE NOW
on
IBM 729's
(all models)
Excellent monthly rates
on 12-36 month leases.
Under IBM Maintenance
Commerical Computers, Inc.
425 Broad Hollow Road
Melville, N.Y. 11746
(516) 293-7278

COMERICA COMERICA
FOR SALE
1401 E-5 System
4-7330 Tape Drives
ALSO
1004-A 80 Column System
All On M/A
PRICED TO SELL NOW
Contact:
Bill Oliver (816) 221-0202
or write:
COMERICA
COMPUTER AMERICA CORPORATION
Suite 103 • 1908 Swift • N. Kansas City, Mo. 64116
COMERICA COMERICA
COMERICA COMERICA
COMERICA COMERICA

IBM SALE
024-$500; 026-$1750; 056-$550; 077-$850; 082-$850; 108-$7500; 402-$2000; 403-$2500; 407-$7000; 514-$1900; 519-$2200; 523-$800; 632-$1400; 604/521-$750; 1316 D. Packs-$125; 954-$750; Dura Card-to-Tape-$1200; 1401/1402-$16,000; 2311-$14,000; 1401/02/06/729 — 12K-$35,000; 1620/22-$8000; 6400-$12,000.
Cummins Conditioner $500.
AALL DATA CO.
105 Hinricher
Willow Springs, Ill.
312-839-5164

AMERICAN USED COMPUTER CORP
MINI SALE
50%-80% off
PDP 8
PDP 9
Varian 620i
IBM 1620
WE TRADE ALL SYSTEMS
Call 617 227-8634
15 School St., Boston, Mass.
A BOSTON COMPUTER GROUP company

FOR LEASE OR SALE
XDS SIGMA 2
4K CORE & ASR 35
5 yr. lease $325/mo.
Sale price $12,000
Available Dec. 70
Owner
J.D. Costello
6322 Hartley Dr.
La Jolla, Calif.
(714) 459-5646

FOR SALE
AT FRACTION OF
ORIGINAL COST
IBM 360 Systems, 7074, 7094, 1401, Univac Systems
EBM COMPANY
625 Bard Ave.
Staten Island, N.Y. 10310
212-273-3636

360/20
FOR SALE OR LEASE
Owner wishes to sell or lease 360/20 C1 8K card system with 2560, 2203, 2501 for immediate delivery. For complete specs and prices please write
Box 3229
60 Austin St.
Newton, Mass. 02160

COMPUTER SAVINGS
On IBM Computers
And Unit Record Equipment
All of Our Machines Are
Under I.B.M. Maintenance
Agreement.
BUY SELL
LEASE TRADE
DESI
DATA EQUIPMENT & SUPPLIES INC.
4621 Concord
Garland, Texas 75040
214-272-7581

WANTED TO BUY
IBM 7074
CW Box 3266
60 Austin St.
Newton, Mass. 02160

WANTED TO PURCHASE
IBM 1620 and GE 225
or related model.
Please give all
specifications and
prices.
Edu-Data Associates
83 Summit Road
South Springs Valley
New York 10977
914-356-8822

UNIVAC 1004
FOR SALE BY OWNER
31 step machine with 80/90 Read feature, Summary Punch, Boards and Wires. Has been under continuous UNIVAC maintenance service agreement since purchased.
Contact:
A. N. Courtney
Midwest Biscuit Company
3000 Mt. Pleasant Street
Burlington, Iowa 52601
319-754-6551

WANT
To Purchase
4 IBM 7330's
Principles Only
Will consider purchasing complete 1401 system if necessary.
Contact: Dean Lawrence
ACCI
P.O. Box 1084
Shawnee Mission, Kansas
913/432-8080

FOR SALE OR LEASE
IBM 1302/2302 for IBM 1410/7010; 40 & 80K 1410 systems; IBM 729 compatibility tape drives; 1401 4, 8 & 12K systems with tape and disk; IBM 7330 tape drives
THE HALSEY CORPORATION
1367 Central Avenue
Middletown, Ohio 45042
513/424-1697

NEW YORK

G.E. 415/425 SYSTEMS
16K
Fairfield/Westchester County Area
203-327-7700
Mr. T. Dewey

UP TO ONE YEAR FREE USE!
On any third generation RCA or IBM computer system. Your premises or ours, Call or Write
(212) 736-2430
MARKETIME CORP.
2 Penn Plaza
N.Y.C. 10001

360/30 64 K
First Shift $65 hr.
Second Shift $55 hr.
Third Shift $45 hr.
Weekends Available
New York City 212-966-1511
Greenwich, Conn. 203-661-4146

THIRD SHIFT AND WEEKENDS
360/40 $50/hour
360/30 $30/hour
Call: Tom Moody
212-475-1830
Dynax Resources, Inc.

ILLINOIS

datanamics
CHICAGO LOOP
Open 24 hrs. a day
7 days a week
Guaranteed Time All Shifts
****
FOUR SYSTEMS
****
360/30 65K
6 tapes, 4 – 2311's
360/40 131K
6 tapes, 5 – 2311's
360/40 192K
6 tapes, 8 – 2314 A01
Standard IC – 6000
12 tapes, for running
IBM 7094/7044
DOS/POWER/OS
1401 CS/30 – CS/40
DATANAMICS
(312) 939-1323
624 S. Michigan, Chicago, Ill. 60605
VOLUME DISCOUNTS

Time for Sale

360/65
768K
OS—MVT—HASP
OR BLOCK TIME
CHICAGO
C. W. SCHMIDT
(312) 346-7300
"TIME ALSO AVAILABLE ON 360/30 65K TAPE AND DISC"

$50 to $75 hour
IBM 360-40
1401-1410 Compatibility
O.S. DOS
Key Punching · Programming
COMPUTYME OF CHICAGO
209 WEST JACKSON BLVD
CHICAGO ILL 312 922-6624

MICHIGAN

IBM 360/30
32K (2-2311's)
******
IBM 2780
Card I/O & Printer
CONTACT: Gary D. Hotchkiss
Ethyl Corporation
Detroit, Michigan
313/542-6940

NEW JERSEY

360/50 $100/hr.
Applied Data Research
Call 609-921-8550
Ask for Bob Perlman

COMPUTER TIME AVAILABLE
NORTH JERSEY & WESTCHESTER
IBM S/360-20
IBM S/360-25
IBM S/360-30
IBM S/360-40
1287 SCANNER TIME
ALSO AVAILABLE
OFF LINE PRINTING
(ALL FONTS)
EXCELLENT PRICES
TIME AVAILABLE
ON ALL SHIFTS
SPECIAL RATES
FOR W/E TIME
Call: L. NELSON
OR JANICE MURPHY
201-471-4300

CALIFORNIA

PAPER TAPE USERS
Duplication, Format/Media Conversion, Listing 9-level Mag Tape, CR/LP Hi-Speed Reader/Punch, Teletypes.
CIRCA THREE
BOX 3463
Glendale, CA 91201
Phone (213) 654-2222

Software for Sale

1130 USERS
Ever want to start a job right now but your system is on another job? 1130 **NOWPOWER** is the answer.
NOWPOWER lets you interrupt any job — run another — then automatically restores your original program.
Write us or Phone
312-748-2900
DMD
data for management decisions inc
22335 Governors Hwy
RICHTON PARK ILL 60471

Software for Sale

*ACCOUNTS PAYABLE
*GENERAL LEDGER
*ACCOUNTS RECEIVABLE
*JOB COST

- S/360 – 25 AND UP
- ALL INSTALLED
- WE IMPLEMENT AND MAINTAIN
- WE GUARANTEE

MANUFACTURING MANAGEMENT SCIENCES, INC.
279 CAMBRIDGE ST.
BURLINGTON, MASS.

CALL	
BOSTON	617-272-2970
NEW YORK	212-239-8234
CHICAGO	312-325-2102
HARTFORD	203-233-8503

3i CO.

SOFTWARE PACKAGES FOR

Searching Chemical Abstracts Science SDF files, Engineering Index Compendex tapes & IEEE reflecs tapes.

Call:
C. Deal at
215-LO9-9717

PAYROLL/ PERSONNEL ACCOUNTS PAYABLE

Package systems designed in a modular, flexible format for a wide variety of users. Standard 360 COBOL, well-written, easily maintained. We'll implement the system, modify it if required and guarantee it for 90 days. Complete, customized documentation provided. Present users are very satisfied. References supplied on request.

For details contact:
COMM-SCI SYSTEMS CORP.
785 Market Street
San Francisco, Calif. 94103
(415) 392-5379

We have three things the big guys don't.

We have a TP Monitor package. A good one.

So do they.

But ours gives you message switching/inquiry/data entry/on-line update all in one.

Also, quicker response to messages.

Also, interface without learning a new language.

Theirs doesn't.

Our DOS and OS on-line control program also provides

- ☐ Terminal and Line Control Support
- ☐ Multi-Tasks Application
- ☐ Interfaces with ALC & COBOL Application Programs
- ☐ Audit File
- ☐ System Recovery
- ☐ DOS to OS Upgrade Capability

This system is in use right now. If you write us, we'll prove how successful it's been.

Automated Financial Systems
Incorporated
One Decker Square,
Bala-Cynwyd, Pa. 19004
(215) 667-1000

INFORMATION RETRIEVAL AND REPORTING

(Hayden Analysis & Reporting Tool)
offers 360 users . . .

- selective retrieval
- calculations
- multi-reporting
- complete editting
- English Input
- many other features

The Hayden Group, Inc.
CREATIVE COMPUTER SYSTEMS
Box 320 New City, N.Y. 10956 • 914-634-3800

Is $5000 too little?

That's what we charge for our COBOL Payroll System.

It's 100% Cobol. And it's being used successfully in dozens of installations.

It has a series of 23 programs which process hourly and salaried payrolls in a multi-company environment, plus:

- ☐ Liberal deduction capabilities.
- ☐ Full labor distribution reporting.
- ☐ Complete file maintenance facilities.
- ☐ Excellent documentation.

It's a good system, and it runs on 32K and two disk drives. We'd like to tell you more about it.

Automated Financial Systems
Incorporated
One Decker Square,
Bala-Cynwyd, Pa. 19004
(215) 667-1000

Information Retrieval and File Maintenance

On-line, high-speed.

On-Line Retrievals: Use *and, or, not,* etc. to compose requests. Answers provided instantly.

On-Line File Maintenance: Change existing records, add new records, directly from on-line terminal.

Variable-Length Records: All records consist of a variable number of variable-length fields.

Display Terminal: Use IBM 2260 display terminals. Other terminals also supported.

Easy to Learn: Non-programmers can learn to use the system in a few minutes.

On-Line Format Specification: Display only the information you really want to see.

Cross Reference: Several files may be stored and cross referenced directly from terminal.

Cross Tabs: Cross tabs and other reports may be requested from terminal.

All of this is available from Computer Corporation of America in 2 models: Model 103 for IBM 360/DOS and Model 104 for IBM 360/OS.

Write us for information. And specify which model you're interested in.

And if you're interested in the batch-processing mode of operation, specify that, too.

Our address is Technology Square, Cambridge, Massachusetts 02139.

Computer Corporation of America

Mop up your payroll problems with MOPS

MOdular Payroll System
the economical solution to efficient payroll implementation, $5,000.00.

• B-3500 COBOL • Easy Implementation • Quality on-site support • Multi Company • Multi division • 60 K • 1 Disk Mod • 2 Tape • 13 Voluntary deductions • Ample earnings codes • Proven operating competence • Complete documentation • Total reporting.

Check these outstanding features, then write:

Marc Barott, Valley Computer, Box 2745, Las Vegas, Nevada 89104, or call Area Code (702) 385-4161, Ext. 271

valley computer
a division of valley bank

DNA SYSTEMS, INC.

Announces

IBM 1130 DISK *SORT*

Fast & Flexible.

FILES:

Sorts FORTRAN & RPG (sequential) files in UA, FX, or WS.

Sorts files in place or into separate output files.

Sorts and merges new data with pre-sorted file (optionally).

Sorts up to 430,000 single drive records, 509,440 multi drive records.

SORT KEYS:

Supports any combination of keys below:
ascending or descending . . .
signed or unsigned . . .

- single and double integers
- part word binary (1-32 bits)
- A1, A2, A3, A4, A6, D1, D4
- RPG A2 and RPG packed
- Floating point . . . standard & extended precision

Specializing in 1130/1800 Software and Systems Services

DNA SYSTEMS INC.
2415 West Stewart Avenue, Flint, Mich.
Zip Code 48504 Tel. 313-789-4402

PAY-RYTE COBOL PAYROLL $2975.00

Complete hourly and salaried payroll system

written in 100% Cobol

modular design permits easy modification

currently running multi-company and multi-plant payrolls on a 32K 360-30

CONDATA

call-Don White-
215-LO9-4240
Condata, Inc.
1809 Walnut Street
Philadelphia, Pa. 19103

THE END OF THE WORLD IS COMING

(In The Form Of Year End Processing)
SOLUTION — LOAD & GO WITH

DUMMY II

In use throughout the nation
Typical applications:
(1) W2's, 941's, 1099's
(2) Year end reports
(3) Year end file maintenance

A fully operational utility package designed to give you the report you need in less than 30 minutes

- **Non compiling with efficient execution**
- **Tape, disk, card input and/or output**
- **Handles sequential, index sequential**
- **Add, subtract, multiply, divide, move, sequence, examine, compare**
- **Table look up capability**
- **Designed for programmers & non programmers**
- **Available under 360 OS, DOS Spectra 70 TDOS**

***** Installation includes training of personnel**

CALL OR WRITE:

Computer Systems & Education Corporation
111 Ash Street
East Hartford, Conn. 06108
(203) 528-9216

Compak/360

For Real-Time Communications Control

Here is a highly flexible real-time communications control package that will operate within the capabilities of your existing IBM 360 Operating System.

Compak/360

- handles I/O for terminals directly attached to the CPU or multiplexed from a front-end computer.
- handles all data base I/O for application programs, responding to terminal inquiries and/or data update requests.
- is adaptable to any IBM 360 configuration that will support the PCP, MFT or MVT Operating System.
- resides within a single partition/region.
- provides an interface between:
  (1) terminal and application program.
  (2) application program and data base.
  (3) application program and application program.
- provides real-time application program loading for execution.
- permits execution of application programs on a time-interval basis.
- provides dynamic storage application for application program-loading.
- supports application programs written in FORTRAN, COBOL, PL1 and ALC.

COMPAK/360 also builds a transaction audit trail of all terminal activity, and ensures system integrity through comprehensive recovery procedures. Learn all about this extremely versatile software product; write or call:

Computer Audit Corporation

1320 Fenwick Lane
Silver Spring, Maryland 20910
(301) 587-0881

NO HURRY?

Save from 30% to 45% on your long-term keypunch conversions.

Call (301) 229-7791
P.O. Box 30085
Washington, D.C. 20014

GENERAL LEDGER

Multi-client, 6 levels consolidation, budget, forecast, recurring entries, accrual reversals. Guaranteed, installed & maintained. A/P, Job Cost, PR, also.

ANCOM SYSTEMS
Division of
General Analytics
9841 Airport Blvd.
Los Angeles 90045

UPTIME FILE MANAGEMENT AND REPORT GENERATOR

Write reports in minutes, create and update any file using a simple, but powerful free-form English language. 25 times faster than COBOL. Currently operational
IBM 360, Univac, RCA.
Price $3000.00

PAYROLL

Multi-branch, hourly and salary, all state and local taxes, generates all corporate and government reports. Currently operational. Thoroughly documented in a clear cut manner. Available for IBM 360 and H-200.
Price $6,000.

AI
AUTOMATED INFORMATION SYSTEMS, INC.
1 Washington Street
Wellesley Hills, Mass. 02181
(617) 237-3580
Reps in: Chicago, Denver, Omaha, Minneapolis, Montreal, Atlanta, London and Stockholm

DØS COBOL CROSS REFERENCE PKG. $250

File Management & Reporting Packages; Programming & Consulting: Assembly Language, COBOL, Fortran 360, 1108, Spectra, Sigma, etc.

SEIDEL COMPUTER ASSOCIATES
8949 Reseda Blvd., Suite 107
Northridge, California 91324
(213) 349-1345

TRANSLATE

Your Autocoder Programs to COBOL for as low as 15¢ per source card

ASSOCIATED COMPUTING SERVICES, INC.

20944 Sherman Way, Suite 101
Canoga Park, California 91303
(213) 884-0945

Why we don't spin-coat our disc packs.

What happens on the joy wheel at the fun house is just about what happens when you spin-coat a magnetic disc.

Centrifugal force causes the magnetic oxides to fly off randomly in all directions within the coating. It makes them bunch up in some areas. And fail to show up at all in others. That's why spinning's not good enough for our disc packs.

We spray our coating on. Our exclusive process is called Uni-Spray.™

Uni-Spray disperses magnetic particles far more evenly than spin-coating. It makes the coating on our Mark I and Mark VI disc packs thinner, smoother, and more durable than all the others. And it's the prime reason we were able to overcome the problem of soft errors (errors caused by uneven dispersion of magnetic particles or surface discontinuities).

So if you want a precision, long-lasting disc pack with a five-year warranty, don't spin off in all directions. Just ours.

Write for our Uni-Spray brochure. Memorex Corporation, Information Media Group, Computer Products, Memorex Park, Santa Clara, California 95050.

MEMOREX

computer industry

a Computerworld news section about the nation's fastest growing industry

November 4, 1970

CI Notes

Cogar to Enter Viatron Arena

WAPPINGERS FALLS, N.Y. – The viability of the Viatron idea of a low cost cassette unit for data capture is being proven by the number of imitators entering or about to enter the field.

A new entry will be Cogar Corp., which has been specializing in semiconductor memory systems.

The firm's expected product will be a key-to-cassette unit employing ICs much like the Viatron device. It will also, like Viatron, have a CRT.

The price and the exact introduction date have not been set but the unit will be "price competitive" and the most likely introduction time will be at the Fall Joint in Houston this month.

Telex Computer Products Goes International

TULSA, Okla. – Telex Computer Products, Inc., has entered the field of international marketing of computer peripherals. Douglas C. Cornwall has been named president and chief executive officer of Telex International Computer Products.

Location of the Telex International headquarters office will be announced immediately following Cornwall's return to England later this month. All product lines offered to overseas customers will be identical with the Telex lines marketed in the U.S. and qualified service representatives will be made available, Telex said.

Cornwall was formerly a member of IBM UK where he was director of data processing sales and member of the board of directors of the UK company.

Interdata Receives $700,000 Order From Japanese Firm

OCEANPORT, N.J. – Kyokuto Boeki Kaisha, Interdata's representative in Japan, has ordered 40 Interdata Model 4 computer systems. The value of the order will exceed $700,000 with deliveries scheduled for the last half of this year.

"This order, on top of what we already have shipped, will make Interdata the largest U.S. supplier of small computer systems to Japan," said Joseph Popola, Interdata manager of marketing operations.

The Model 4 computers will be utilized in a variety of applications from numerical machine control and automated drafting systems to power plant controllers and on-line communications systems.

Dick to Upgrade Videojet Non-Impact Printer

CHICAGO – A.B. Dick will upgrade its Videojet non-impact printer so that it can be used as a stand-alone terminal at the Fall Joint this year.

The firm has been working on a number of methods to accomplish the goal, and it now appears that it will use a keyboard device to enter data on magnetic tape for transmission to the computer at the same time that the information is printed on the Videojet printer.

The price has not yet been determined.

Commerce Identifies 8 Non-European Countries As Good Markets For U.S. Manufactured Products

By E. Drake Lundell Jr.
Computer Industry Editor

WASHINGTON, D.C. – In line with its new "Go Global" export marketing program [CW, Oct. 7] the Department of Commerce has identified eight non-European countries as good prospects for American EDP equipment makers, in addition to the 14 European countries previously identified [CW, Oct. 14].

The export drive is aimed at singling out particularly lucrative overseas markets for U.S. manufacturers and involves in-depth market research on the part of the Department's Bureau of International Commerce.

The eight countries tagged for special study include:

Argentina – This market is called "brisk" with special emphasis on medium and small machines, printers, and other I/O devices. IBM dominates the market, which imported $5 million in equipment in 1969 and will import over $12.2 million in 1975. Main competition to U.S. manufacturers comes from France and the United Kingdom.

Australia – Imports of equipment jumped 40% between 1968 and 1969 – from $23.6 million to $33.1 million and a growth rate of 25% is predicted for 1970-71 with a 20% rate from then to 1975.

U.S. manufacturers lost their lead in the import race in 1969 when Britain accounted for 52.5% of imports compared with 24.4% from the U.S. Opportunities are good for small and large computers, OCR and Micr equipment, an I/O devices. Services and software are also considered areas of high sales potential.

Brazil – The growth rate projected for the Brazilian market, estimated at $14 million last year is 20% each year up to 1974. The U.S. controls about two-thirds of this market and will supply imports valued at $23 million by 1975.

Medium and small scale computers are the items most in demand, followed by printers, magnetic tape encoders, MICR equipment, media converters, memory systems and terminals.

Canada – The U.S. supplies 93% of the imports into Canada and should remain with over 90% of the market up to 1975. Small and large size computers, disk memories, printers, and key-to-tape equipment are considered the best bets for U.S. firms wanting to export to Canada. Banking, insurance, and government agencies are seen as the most receptive buyers.

Israel – Civilian EDP is expected to advance at a 30% rate through 1975, reaching a value of about $37 million. Defense figures are not given, but are considered significant.

Highest potential is seen for small computers, printers, keyboard encoders, converters, digital and analog multiplexers, and magnetic tape systems. Government, banking and insurance, and education are considered good markets.

Japan – The Japanese market will be valued at about $2.2 billion in 1974 and when U.S. exports are estimated to reach about $259 million. The highest sales potential is seen for large computers, imprinters for magnetic ink characters, mark sensing equipment, OCR and MICR readers, and CRT systems, in addition to software.

The five largest end users are finance, electrical machinery, wholesale, retail, and service bureaus.

Mexico – Imports will reach $24.3 million by 1974 with the U.S. accounting for about 65%. Products with a good chance of success include medium and small systems, card to tape converters, printers, magnetic ink readers, digital multiplexers, card handling systems, punched card collators, graphic data systems, computerized typesetting systems, software, and training aids. The largest users are distribution, manufacturing, government and financial institutions.

Venezuela – Imports are projected at $15 million in 1974, with the U.S. supplying about 35%. Medium, small and mini systems are seen as having good potential, as are printers, magnetic tape encoders, tape transports, data transmission equipment, and software.

Navy Outlines Future Computer Purchases; Will Update List

By Michael H. Blake Jr.
CW Washington Bureau

WASHINGTON, D.C. – The Navy has released its latest quarterly update of anticipated EDP equipment procurements for the year Oct. 1 to Sept. 30, 1971.

The information is subject to change and is presented for planning purposes only, the Navy's automatic data processing equipment selection office pointed out.

The forecast will be updated in approximately three months, and more specific information will be routinely provided on a case basis via a pre-solicitation inquiry letter approximately one month prior to actual issuance of the Request for Proposal (RFP) to firms of the official mailing list.

For the fourth calendar quarter of 1970, the Naval Ship Systems Command will replace existing installations with 11 large-scale computers at Casdo, Boston, and at 10 Navy shipyards in Mare Island, Hunters Point and Long Beach, Calif.; Boston; Norfolk; Charleston, S.C.; Philadelphia; Puget Sound, Wash.; Portsmouth, N.H.; and Pearl Harbor.

The Naval Supply Systems Command plans to replace a number of Univac Fastrand II drums with compatible storage devices at several locations. The Bureau of Navy Personnel will acquire 128 terminals to interface with a GE 635 system. The 115 conversational, 10 CRT, two graphic and one remote batch terminals will be located at the Naval Academy in Annapolis, Md.

Planned procurements for the first calendar quarter of 1971 include the replacement of two IBM 1401s, one NCR 315, two RCA 501s, one RCA 3301 and one IBM 360/50 with a large scale computer system with remote terminals at several locations in the Washington, D.C. area, for the Naval Material Command Support Activity, Arlington, Va.

In the second 1971 quarter, the Bureau of Medicine and Surgery will acquire one small-scale computer each at the Naval Hospital, Camp Lejeune, N.C.; Charleston, S.C.; Agana, Guam; Jacksonville, Fla.; and Newport, R.I.

The Chief of Naval Operations will acquire one medium-scale computer for the Naval Oceanographic Distribution Office, Clearfield, Utah.

Equipment to be procured during the third quarter of 1971 includes a large-scale computer to replace two CDC 3800s at the Naval Research Laboratory, Washington, D.C.; and one small computer for the Bureau of Medicine and Surgery's Medical School in Bethesda, Md.

Further information is available from the Department of the Navy, Automatic Data Processing Equipment Selection Office, 1911 Jefferson Davis Highway, Arlington, Va. 20390.

Westinghouse Stresses Service As It Enters Mini Marketplace

By a CW Staff Writer

ORLANDO, Fla. – Westinghouse, long in the control computer market, has entered the industrial, communications, and scientific market for small, general purpose computers.

The first product from the new computer department of the Computer and Instrumentation Division is the Westinghouse 2500, a 16-bit processor with a 4K-word memory expandable to 65K words.

The computer is far from unique and marketing emphasis will be on filling customer needs ("Proven software and reliable, field expandable hardware"), on the company's reputation ("You can be sure if it's Westinghouse"), on the company's size ("We'll still be around two years from now"), and on the company's ability to provide systems support.

"Of utmost importance," said Robert L. Gregg, national sales manager, "is assurance of the best possible service to the customer."

In planning and executing its entry into the new market, Westinghouse is drawing on experience gained three ways: from making control computers; from using computers made by other companies; and by hiring experienced people from other computer manufacturers.

In fact, 12 members of the initial 16-man sales, support, and service force were hired from other manufacturers, Gregg said.

The department also located its new plant here to help attract people from other companies, according to W. Marshall Brittain, department manager.

Westinghouse has pledged to begin deliveries of the 2500 in the second quarter of 1971. Although the plant isn't ready yet and only a mockup of the 2500 was shown at the announcement conference, company executives said many of the components would be built at existing Westinghouse facilities and expressed confidence they could deliver on schedule.

Disk Crashes — Part II

Two Ways Outlined to Test for Crash-Causing Defects

By E.E. Kirsch
Special to Computerworld

Some disk defects can be detected during manufacture and quickly repaired, eliminating many on-site head crashes at user installations.

The solution to surface protrusion defects is very straight forward. A manufacturer can simply fly a special head at one-half or less than the normal flying height of a read-write head. If a head-disk contact is detected, then the protrusion can be burnished out.

The only real problem is the detection of a head-disk contact. Equipment is available to do this and is fast enough that the direct labor costs per disk are about three cents. This is low enough to permit the necessary 100% testing of all disks.

The solution to the problem of substrate flaws is not so straight forward due to the nature of the defects. To appreciate the quality level required in the disk substrate, it is necessary to realize that the head-disk combination forms an aerodynamic system that is required to maintain a near-constant distance of approximately one hundred millionths of an inch between the read-write gap and the disk surface.

If the disk surface were perfectly flat, there would, of course, be no problem with head crashes due to this type of defect. In the real world it is impossible to manufacture in high volume and at reasonable costs disks that are perfectly flat.

The problem lies in defining the degree to which the disk may be out-of-flat and then measuring each disk surface to determine when that limit is reached.

The problem is compounded by the fact that the head is able to move freely upward or downward and is thus able to follow rather gross vertical variations (runout) in the disk surface.

When a runout condition exists, as is usually the case, the head sees the disk surface as a slope, either upward or downward. The surface slope can be defined as the vertical change at the head per inch of surface travel (waviness) or as the vertical change at the head per second (velocity).

Whenever the head sees a sloping surface, it attempts to follow the slope. There is a mechanical response time required due to inertia of the head, however, which prevents it from following the slope or change in slope instantaneously.

The head movement lags behind the surface slope slightly, therefore, whenever there is a change in the slope. The change in slope is referred to, quite appropriately, as vertical acceleration of the surface, or simply as acceleration.

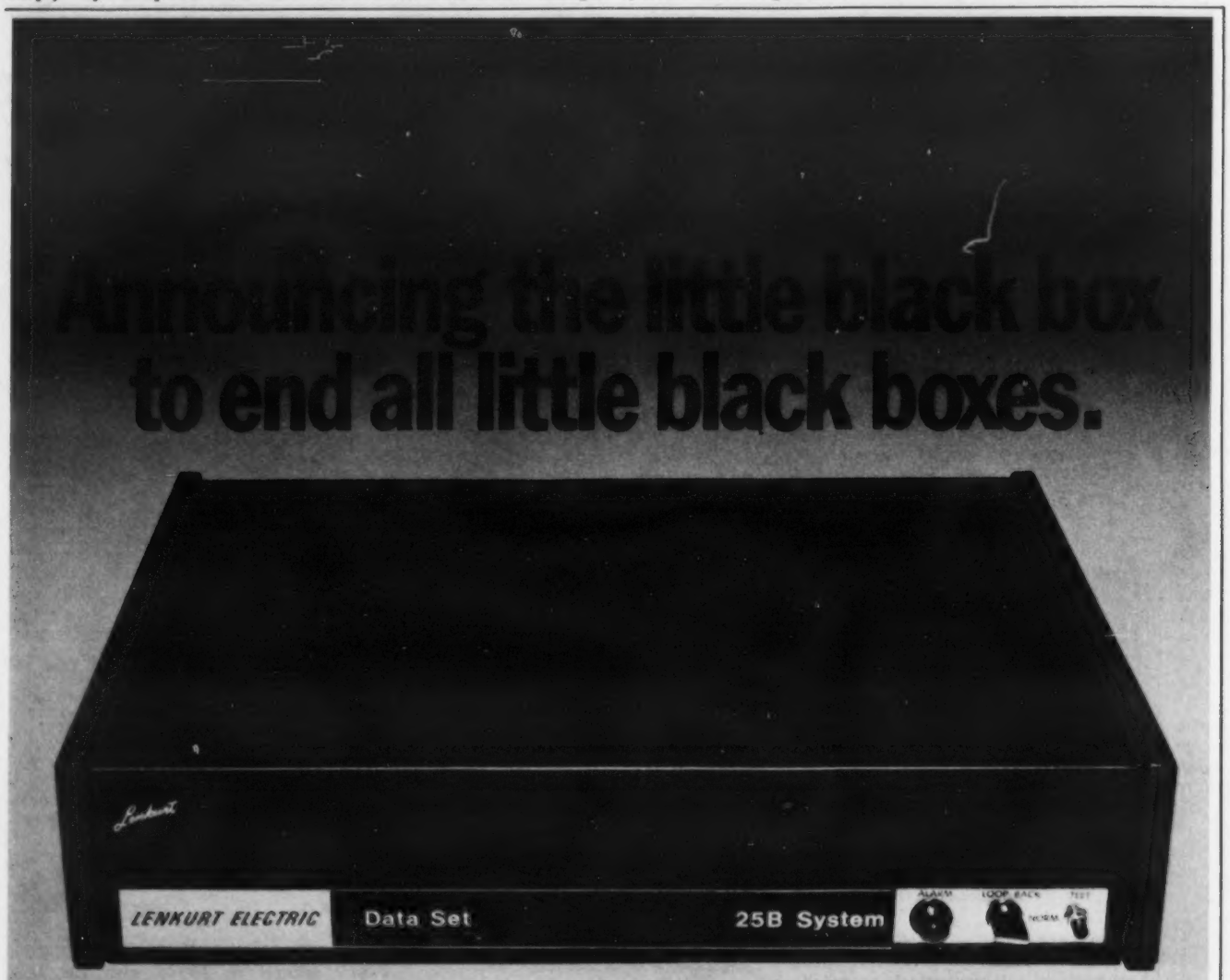
If substrate surface accelerations cause head crashes, why do pack manufacturers not check for these accelerations and eliminate defective substrates? It is a natural question, but the answer is not so easy.

Historical surface measurements include surface finish, waviness (or slope), and runout, but not acceleration. The need for addition of acceleration as a surface flatness parameter has not existed in earlier applications and techniques for measuring acceleration were not developed. In fact, it has only been in the very recent past that an awareness of the need has started to appear.

As a result, even today, many disk pack manufacturers limit their substrate surface specifications to the historical parameters of surface finish, runout, and waviness, and even worse, specify the last two parameters at the outer radius of the disk only.

The pack manufacturer now has available to him the necessary equipment to perform the desired tests at less than two cents per disk in direct labor costs. By so doing, he can assure the disk pack user of freedom from head crashes due to substrate flaws.

E.E. Kirsch is president of Three Sigma, Inc., a subsidiary of Computest Corp.



The Lenkurt 25B may be the only data modem that really deserves to be called a little black box.

For a modest-sized piece of equipment, it does an amazing job.

It handles computer, telegraph, and telemeter data . . . individually or in combination.

You can transmit up to 25 channels over a single voice circuit. Plug-in filters give you a choice of five data speeds from 75 b/s to 600 b/s.

And you get 20% more speed for a given channel spacing than you've ever had before.

You can use it for single-channel or multi-channel operation. Or as terminal equipment to work into other modems.

People who know our other video, voice, and data equipment won't be surprised to learn that the 25B is fully compatible with Western Electric's 43A/43B. (We've always been very easy to get along with.)

The 25B is a great little black box, designed by a company that really knows data transmission. (And microwave, multiplex, cable carrier, and coaxial cable systems, too.)

Even though to us, it will always be a computer-telegraph-telemeter data modem to end all computer-telegraph-telemeter data modems.

LENKURT ELECTRIC
Subsidiary of GENERAL TELEPHONE & ELECTRONICS

Lenkurt Electric Co., Inc., San Carlos, California.

Data Transmission Systems from Lenkurt

Computer Tests Milk

YORK, Pa. — Lancaster County members of the Dairy Herd Improvement Assn. have voted to have their milk tested by computer at Penn State. Milk samples formerly have been processed locally.

The new system features use of Milk-O-Tester units, costing $18,000 each.

COMPUTERWORLD

financial

Xerox Net up in 3d Period

STAMFORD, Conn. – Despite a dragging computer business, copier-making Xerox Corp. has turned in a 13% increase in income for the third quarter and a 17% increase for the nine months.

In his report, Xerox President C. Peter McColough said that "computer results for the quarter reflect continued unfavorable trends, particularly in our tight sales in the government-related and service bureau markets. In addition, results were affected by increased expenses for development and programming."

Shortly after the third quarter announcement, Xerox revealed that it had named William F. Glavin as new president and chief executive of Xerox Data Systems, the computer subsidiary.

Glavin replaced Dan L. McGurk, a founder of Scientific Data Systems before it was purchased by Xerox. McGurk also resigned as Xerox group vice-president, though he remains a director.

No reason was given for McGurk's resignation.

Glavin joined XDS early this year after working for IBM for 15 years.

For the third quarter Xerox earnings stood at $47.6 million, or 61 cents a share, up from $42.1 million, or 54 cents a share, for 1969. Volume rose from $384.2 million to $435.8 million.

Nine month net reached $141.5 million, or $1.81 a share, from $120.5 million, or $1.56 a share, on an increase of revenue from $1.09 billion to $1.27 billion.

The mainstay of Xerox's growth continues to be xerography. Copier and duplicator revenue in the third quarter rose 22% from the year before, and orders and installations "remain better than expected" according to McColough.

He also noted that the Education Group and international operations showed good gains.

This year's results have been consolidated with those of majority-owned Rank Xerox, Ltd., a British subsidiary.

DEC Earnings Fall in 1st Quarter; Weak Economy Cited by Olsen

By Michael Merritt
CW Staff Writer

BOSTON – At its annual meeting Digital Equipment Corp. revealed that for the first quarter of fiscal 1971 it had posted essentially flat earnings on an increase of sales to $34 million from $28.9 million.

Earnings were $2.95 million, or 30 cents a share, down from $2.9 million, or 32 cents a share, for the earlier period.

DEC President Kenneth H. Olsen laid the blame for the earnings drop to the weak economy and reduced government spending. "We had expected some upturn in the fall," he noted, but it hasn't materialized.

When queried about flat earnings on increased sales, he said: "When we laid out our plans we expected to ship more [this quarter] . . . ."

Cutbacks

He said, however, that he didn't "visualize any significant cutbacks anywhere," and that DEC is using the period to increase its sales and service forces.

The company president also revealed that DEC will release "in the next few weeks a whole new line of peripherals" and that it is working on a new CPU for the large-scale PDP-10.

Olsen noted that PDP-10 sales have been hurt by the poor showing of time-sharing companies, but that DEC is finding new markets for the machine in the educational field and in-house T/S users.

DEC is one of the last of the spectacular computer growth companies to falter in a slumping economy. Olsen said, though, that price-cutting has not been a factor in DEC's lag.

'Same Make-Up'

The new PDP-8/E, a $5,000 mini, carries the "same mark-up, it's on the same schedule," as the company's other computers, he said.

In the last quarter DEC's sales force has grown from 300 to 400 and the service staff from 650 to 800.

While DEC has always been "very cautious and conservative" in its growth, Olsen said the company saw the present as a time for stronger competition and a good opportunity for expansion.

NCR Posts 12% Revenue Rise

NEW YORK – Worldwide revenue of the National Cash Register Co. totaled $993 million during the first nine months of the year, a 12% increase over the $882 million reported for the comparable period of 1969.

Consolidated net income was $28.1 million compared with $27.6 million last year, an increase of 2%. On a fully diluted basis, the nine-month earnings were $1.31 a share compared with $1.29 in 1969.

The company's third-quarter revenue totaled $342.1 million, an 11% increase over 1969's third-quarter revenue of $308.2 million. Third-quarter earnings were $9.5 million compared with $10.2 million for last year's third quarter, a decline of 7%. The quarterly earnings amounted to 45 cents a share compared with 48 cents a share for the comparable 1969 period.

In announcing the nine-month and third-quarter results, Robert S. Oelman, NCR chairman, said the company's international operations have resulted in increased orders, shipments and earnings during each of the first three quarters.

"The continued weakness of the U.S. economy, however, has adversely affected the results of our domestic organization which had been geared for greater volume than has been achieved during 1970," Oelman said.

The NCR chairman also cited the current softness in the paper industry and a strike at one of the company's mills which unfavorably affected results at NCR's papermaking subsidiary.

Another NCR subsidiary, Electronic Communications, Inc., is experiencing lagging sales and earnings this year due to cutbacks in military and space programs, he added.

Oelman said the company has taken a number of cost-reduction and capital-conservation actions in view of current business conditions and that these steps have helped offset the impact of lower than anticipated volume.

Pfeiffer Replaces Rogers As IBM DP Division Head

By Michael Merritt
CW Staff Writer

ARMONK, N.Y. – When the computer industry has pneumonia, IBM sneezes.

The day after announcing the System 3/6 and the System 7, Francis G. "Buck" Rogers was promoted out of his job as president of IBM's Data Processing Division into the position of IBM director of marketing, with responsibility for the corporate marketing and services staffs.

Ralph A. Pfeiffer Jr. has become the new head of the DP Division, after serving as IBM vice-president, corporate operations staff, Pfeiffer remains a vice-president.

In addition, James J. Johnson has returned to the position of vice-president of the DP Division, Eastern region manager, a post he left only one year ago. His interim position was IBM director of marketing, Rogers' new job. Johnson replaces Joseph Henson.

IBM maintains that the move is not a management shakeup, but only the normal circulation of executives. An IBM spokesman pointed out that the normal tour of duty as DP president is two years, a position Rogers has held for three or four years.

Rumors that IBM's salesmen are running at 60%-65% of total quota are thick, however, and IBM watchers say that the eastern region is a particularly sore spot.

A vice-president of one of the contenders for the number two slot in the computer industry commented: "Bookings are down in the East and elsewhere—under quota. At IBM this means bringing up a new quarterback, right or wrong. I've never seen a marketing manager who has survived for long, and president of DP is a marketing position. It has to be a shakeup pure and simple, in that they are not making quota."

EAI Records Loss for Quarter

WEST LONG BRANCH, N.J. – Things are still looking pretty rocky at Electronic Associates.

The analog computer-maker reported a net operating loss of $758,000 for its third quarter, topped off by an extraordinary charge of $3.75 million.

Ten years ago touted as a potential giant of the computer industry, the long-ailing company ended merger negotiations with Computing Efficiency, Inc. earlier this month, and revealed it is searching for a new president.

For the nine months EAI has reported a net operating loss of $5 million, not counting this quarter's extraordinary charge.

Third quarter sales were $7.1 million and nine month sales totaled $21.7 million.

The extraordinary charge stems from an accounting change that went into effect at the beginning of the year. Because of the change this year's figures are not comparable to those reported last year.

In 1969 EAI reported a net loss of $811,000 on sales of $8.5 million for the third quarter.

CAN A SLOW, INACCURATE KEYPUNCH OPERATOR EVER FIND HAPPINESS AT ONE OF YOUR MACHINES?

Let's just say, we all hope they become fast and accurate. That would make you happy and when you're happy, they're happy.

Where do we come in?

Our business is improving the efficiency and productivity of keyboard operators (keypunch, magnetic tape, TTS and typists). This is accomplished primarily by reducing operator error rate and increasing speed. Our first priority is accuracy. We do all of our training "on site" while the operators are on the job. This new method gives you an important advantage: There is little to no production time lost while the improvements are being made.

Since we send the instructor to your facility, we have the added flexibility to tailor design the courses to your specific needs.

Example: A single course could consist of several experienced keypunch operators being upgraded in efficiency along with a few trainees or a few typists, while still others are being converted from one type machine to another.

We have improved operators and typists for very large, well-known companies as well as much smaller service bureaus. The average increase in productivity is 24%. References are included in our brochure.

During our stay a complete "data flow analysis" of your data preparation department would be compiled and included in the end-of-course report.

We train anywhere in the United States and most parts of Canada.

Upon request, we will send you our free brochure which includes information regarding a no cost, no obligation evaluation of your operators.

If you would like to know more about our programs, please check the appropriate block below and write to us.

Data Control Techniques, Inc.
211 Elmer Street
Westfield, New Jersey 07090
Phone: 201-233-5500

DCT INC.

☐ I would like DCT to mail me their free brochure
☐ I would like a DCT representative to call me by phone to discuss some of the details.

Name _____ Title _____
Company _____
Street _____
City _____ State _____ ZIP _____
Phone _____ Please indicate your total number of operators _____

Acquisitions

Information Machine Corp. of San Diego, has acquired **Century Computer Services, Inc.** and **Com-U-Trol Corp.** of Chicago, for stock valued at about $3.7 million.

Electronic Processors, Inc. (EPI) of Englewood, Colo., has become a subsidiary of the **Samsonite Corp.** EPI manufactures minicomputers and tape cassette decks.

Carterfone Communications Corp. has purchased the interest of Data Automation Co. in its subsidiary, **Data Automation Communications Corp.**, a data communications equipment leasing and servicing company.

Adage, Inc. has reached an agreement in principle to acquire **Computer Displays, Inc. (CDC)** Waltham, Mass. CDI manufactures a graphics display terminal which Adage said complements its existing line of terminal systems.

Systems General Corp. has acquired **Electromec Computing and Technical Services** of Santa Clara, Calif. Systems General initially issued shares valued at $3 million in exchange for all Electromec shares, with additional contingent shares. Electromec provides computer, technical, and graphic services primarily in California and the southeastern U.S.

Tim, Inc. and the **Time-Sharing Division** of Pryor Computer Industries have agreed to merge. The new company will be called Pryor-Tim, Inc. Both firms are engaged in time-sharing in the Chicago area.

Software Systems has agreed to acquire the Washington, D.C., information processing center of **Tracor Computing Corp.** and its keypunch service bureaus in Broadway and Harrisonburg, Va. The Tracor operations will be absorbed by the Reid and Thomas service bureau which will occupy Software Systems' former headquarters.

ACQUISITION WANTED

We are a successful data collection and transmission manufacturing Company with excess cash.

We have to offer:

1. Thousands of successful installations throughout the United States.
2. A strong end user marketing organization (including systems support) operating country wide.
3. A field service organization of Company personnel located throughout the United States.
4. An excellent engineering and manufacturing organization.
5. A strong management team.
6. An outstanding financial position with a solid earnings growth.

We are looking for:

1. A manufacturer of Electronic Data Processing equipment (End use or O.E.M.)
2. Products that relate to data collection, data transmission, point-of-sale and computer peripherals.
3. A Company with a good product that has been tested and is operating and has mass market potential.
4. A Company with engineering strength that needs marketing and financial assistance.

We are interested in acquiring such a Company for either cash or an exchange of stock.
All replies will be treated with the strictest of confidence.

Please reply to: CW Box 3265
60 Austin Street Newton, Mass. 02160

PROGRAM PRODUCTS FROM BRI

IF you are using **SMF**, *or planning to, then you should know about* **CIMS/II.**

CIMS/II *is a complete interface to SMF that allows a user to effectively utilize and analyze the data collected.* **SEND** *us your SMF DUMP TAPE and we will send you CIMS/II reports on your data.*

IF you don't like the overhead of SMF, but still need the essential data, ask us about **CIMS/I.**

ALL PRODUCTS ARE OFFERED ON A 30 DAY EVALUATION PERIOD AND IN SOURCE CODE.

For further information please call or contact:

Manager, Software Marketing
Boothe Resources Int'l
3435 Wilshire Blvd.
Los Angeles, Ca. 90005
(213) 380-5700

Graham Magnetics Revenues up 62%

GRAHAM, Texas – Graham Magnetics Inc., manufacturer of magnetic tapes, has reported a 62% increase in net sales for the first quarter of the new fiscal year, and net income more than six times greater than that of the comparable period a year ago.

Net sales of the Texas firm rose to $1.6 million for the quarter ended Sept. 30, 1970, compared with $970,145 for the same quarter of 1969.

Net Income

Net income for the first quarter rose to $204,517, or 30 cents per share, including a nonrecurring gain of $60,652 from the recovery of prior year's losses.

Earnings from operations for the quarter was $143,865, or 21 cents per share, which compares with net income of $29,969, or four cents per share for the same period last year.

Increasing Acceptance

George A. Jaggers, chairman of the board and president, attributed the company's strong sales performance and increased earnings to increasing acceptance of Graham's products by the industry and to increased operating efficiences.

Beta Colors 3d Quarter Black

NEWTON, Mass. – Beta Instrument Corp. reported earnings for the period of 1970 of $33,345 or one cent per share on sales of $760,264 as compared with losses of $129,740 or 12 cents per share on sales of $244,328 for the same period last year.

For the nine months ended Sept. 30, 1970, sales reached $1.8 million compared with $616,465 for the same period a year ago. Earnings for the first nine months, 1970 were $16,184 or one cent per share compared with a loss of $322,310 or 31 cents per share for the comparable period in 1969.

Beginning with this year's quarter, product development expenses have been capitalized, while in 1969 all such costs were expensed when incurred.

Beta Instrument Corp., which began operations in 1962 as a manufacturer of CRT display equipment, introduced a COM system in May 1969.

Computer Sciences Revenues Rise, But First-Half Earnings Lagging

LOS ANGELES – Computer Sciences Corp. (CSC) announced record revenues of $52.8 million for the 26 weeks ended Sept. 25, 1970, with lagging earnings of $2.5 million, or 20 cents per share, for the period.

According to W.R. Hoover, CSC president, the revenue increase over the $48.9 million in the first half of the preceding year continues to reflect the strong growth in the company's contract service business.

Earnings, however, declined from $5.7 million, or 45 cents per share, for the prior year.

The significant factors in the earnings reduction, according to CSC, have been a continuation in the decline of the highly profitable sales of proprietary products and services caused by generally depressed economic conditions worldwide, reduced investment tax credits, and increased interest costs.

Hoover said the decline in proprietary sales has resulted in a decreased revenue growth rate.

Interdata 9-Month Earnings Drop

OCEANPORT, N.J. – Interdata, Inc. has posted consolidated revenues of $1.7 million for the three-month period ended Sept. 25, 1970, resulting in a net income of $33,700 or two cents per share.

For the nine-month period revenues were $4.6 million, resulting in a net income of $106,600 or six cents per share. During the comparable nine months in 1969, the company had revenues of $3.8 million and a net income of $161,700, representing 11 cents per shared.

Interdata's president noted that during the past three months the company has received a record number of orders.

CW Sales Offices

National Sales Manager
Neal Wilder
Sales Administrator:
Dorothy Travis
COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
(617) 332-5606

New England Regional Manager
Robert Ziegel
COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
(617) 332-5606

Mid. Atlantic Regional Manager
Donald E. Fagan
COMPUTERWORLD
254 West 31st Street
New York, N.Y. 10016
(212) 594-5644

Phila.-Wash. D.C. District Manager
John Cummings
COMPUTERWORLD
Suite 510
2021 "L" Street, N.W.
Washington, D.C. 20036
(202) 466-2630

Midwest Regional Manager
Bill Goodfellow
COMPUTERWORLD
Suite 218
25 East Chestnut
Chicago, Illinois 60611
(312) 944-5885

Southeast Regional Manager
Ed Graham
COMPUTERWORLD
Stemmons Tower West
2730 Stemmons Freeway
Dallas, Texas 75207
(214) 638-1140

Los Angeles Area:
Bob Byrne
Sherwood/Byrne/Clarkson
& Associates
1017 N. LaCienaga Blvd.
Los Angeles, Calif. 90069
(213) 657-6221

San Francisco Area:
Bill Healey
Thompson/Healey Assoc.
1111 Hearst Bldg.
San Francisco, Calif. 94103
(415) 362-8547

Japan:
Mr. Naoyoshi Ando
Fuji Corporation
3-1, 5-Chome Yoyogi
Shibuya-Ku
Tokyo, Japan

Earnings Reports

SPERRY RAND CORP.
Three Months Ended Sept. 30

	1970	1969
Shr Ernd	$.50	$.55
Revenue	409,435,000	400,280,000
Earnings	17,072,000	18,891,000
6 Mo Shr	1.00	1.01
Revenue	836,562,000	809,739,000
Earnings	34,247,000	34,560,000

ELECTRONICS ASSOCIATES
Three Months Ended Sept. 30

	1970	1969
Revenue	$7,059,000	$8,537,000
Spec Chg	a3,752,000	.....
Loss	4,510,000	811,000
9 Mo Rev	21,728,000	27,423,000
Spec Chg	a3,752,000	.....
Loss	8,829,000	540,000

a-Resulting from a change in accounting procedures.

VICTOR COMPTOMETER
Three Months Ended Sept. 30

	1970	1969
Shr Ernd	$.43	$.39
Revenue	44,594,839	39,676,501
Earnings	2,239,761	2,027,416
9 Mo Shr	.92	1.36
Revenue	121,879,196	118,057,053
Earnings	4,853,883	7,054,749

XEROX CORP.
Three Months Ended Sept. 30

	1970 (000)	a1969 (000)
Shr Ernd	$.61	$.54
Earnings	435,800	384,200
9 Mo Shr	1.81	1.56
Revenue	1,266,700	1,092,100
Earnings	141,500	120,500

a-Restated to include Rank Xerox.

NATIONAL CASH REGISTER
Three Months Ended Sept. 30

	1970	1969
aShr Ernd	$.45	b$.48
Revenue	342,135,000	308,237,000
Earnings	9,532,000	10,284,000
a9 Mo Shr	1.31	b1.29
Revenue	991,257,000	42,100
Earnings	28,113,000	27,645,000

a-On a fully diluted basis. b-Adjusted to reflect two-for-one stock split in May, 1970.

WABASH MAGNETICS INC.
Nine Months Ended Sept. 30

	1970	1969
Shr Ernd	$.29	$.47
Revenue	19,416,904	18,686,264
Earnings	514,722	819,276

TELEDATA INC.
Year Ended June 30

	1970	1969
Shr Ernd	a$.48	$.31
Revenue	17,053,018	7,369,047
Spec Item (Loss)	b(262,202)	c1,318
eEarnings	523,811	338,703

a-Based on income before special item. b-Consists of loss of $267,695 from sale of subsidiary and a gain of $5,493 from sale of real property. c-From tax benefits. e-Equal to 32 cents a share in 1970 and 31 cents a share in 1969.

AMERICAN RESEARCH & DEV.
September 30

	1970	1969
Asset, Shr	$75.14	$.14
Net Assets	461,349,489	459,204,088

(Continued on Page 35)

TRADE*QUOTES

Computerworld Stock Trading Summary

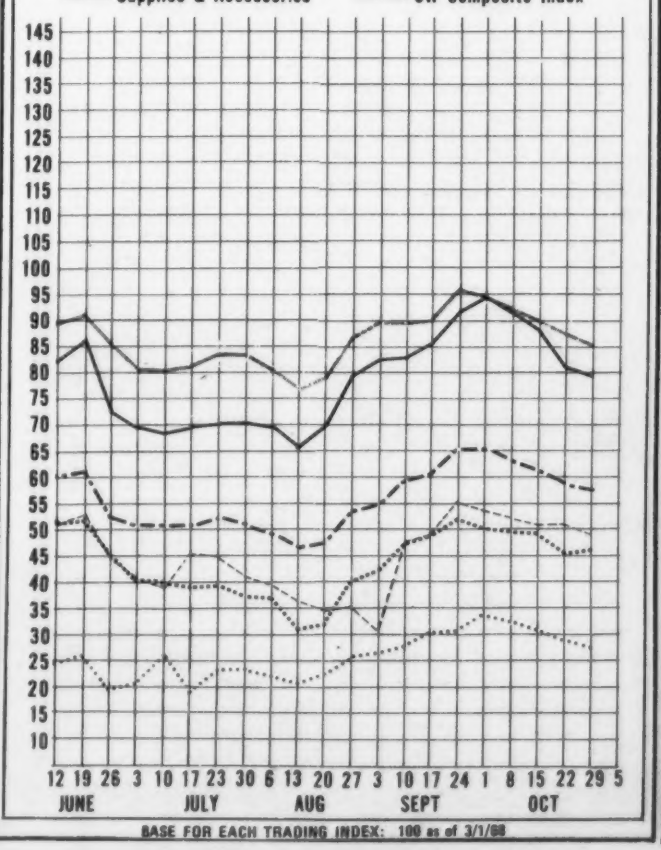
All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, OCTOBER 29, 1970

EXCH		1970 RANGE (1)	CLOSE OCT 29 1970	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 6	2 1/8	- 1/8	-5.5
A	APPLIED DATA RES.	4- 24	6 3/8	- 1/4	-3.7
O	APPLIED LOGIC	2- 19	1 1/2	- 1/8	-7.6
O	ARIES	1- 8	2 1/2	+ 1/8	+5.2
A	AUTOMATIC DATA PROC	23- 47	41 7/8	+2 3/4	+7.0
O	AUTO SCIENCES	3- 14	7	+1	+16.6
O	BRANDON APPLIED SYS	1- 9	1 1/4	0	0.0
O	COMPUTER AGE INDUS.	1- 3	1 3/8	- 1/8	-8.3
O	COMPUTER ENVIRON	3- 14	2 1/2	0	0.0
O	COMPUTER INDUS.	2- 10	6 1/2	0	0.0
O	COMPUTER NETWORK	3- 14	3 3/4	- 1/4	-6.2
O	COMPUTER PROPERTY	5- 15	6 1/2	+ 1/4	+4.0
N	COMPUTER SCIENCES	6- 34	11	- 1/8	-1.1
O	COMPUTER USAGE	2- 8	3 3/4	0	0.0
A	COMPUTING & SOFTWARE	16- 75	31 5/8	0	0.0
O	COMRESS	2- 10	2 1/2	- 1/8	-4.7
O	COMSHARE	3- 15	4	- 3/8	-8.5
O	CONSOL. ANAL. CENT.	1- 3	1 1/4	0	0.0
O	DATA AUTOMATION	1- 24	1 3/8	- 1/2	-26.6
O	DATA PACKAGING	5- 29	6 1/2	-1 1/4	-16.1
O	DATAMATION SERVICE	1- 6	1 3/4	+ 1/4	+16.6
O	DATATAB	4- 9	4 1/4	- 1/4	-5.5
O	DIGITEK	2- 5	1 1/2	0	0.0
O	EDP RESOURCES	5- 13	7 1/4	- 3/4	-9.3
A	ELECT COMP PROG	3- 11	4 5/8	+ 3/8	+8.8
O	ELECTRONIC DATA SYS.	31-161	66 1/2	+9	+15.6
O	INFORMATICS	4- 21	6	-1 3/4	-22.5
A	ITEL	6- 26	16 1/4	+ 3/8	+2.3
O	LEVIN-TOWNSEND SERV.	1- 13	2 1/4	- 1/4	-10.0
A	MANAGEMENT DATA	8- 25	11	+ 1/8	+1.1
O	NAT COMP ANALYSTS	1- 8	3	- 1/4	-7.6
O	NAT.COMP. SERV.	3- 12	3	-1 3/4	-36.8
N	PLANNING RESEARCH	13- 54	20	- 3/4	-3.6
O	PROGRAMMING METHODS	9- 27	15 1/2	0	0.0
O	PROGRAMMING & SYS	2- 5	2	- 1/4	-11.1
L	PROGRAMMING SCIENCES	2- 33	1 1/4	- 3/8	-23.0
N	SCIENTIFIC RESOURCES	2- 22	4 1/4	0	0.0
O	SOFTWARE SYSTEMS	1- 2	5/8	- 1/8	-16.6
O	TBS COMPUTER CENTERS	4- 27	4 1/2	0	0.0
O	UNITED DATA CENTER	2- 4	2 1/2	- 1/4	-9.0
N	UNIVERSITY COMPUTING	14- 99	23 3/8	-5 1/4	-18.3
A	URS SYSTEMS	5- 21	7 1/2	+ 3/4	+11.1
O	U.S. TIME SHARING	3- 14	2 3/4	-2 3/4	-50.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	21- 62	27 1/4	- 5/8	-2.2
O	ALPHANUMERIC	2- 15	3 5/8	- 1/2	-12.1
N	AMPEX CORP	13- 48	17 3/8	+ 1/8	+0.7
O	ASTRODATA	3- 34	2 1/2	-5 3/8	-68.2
O	BOLT,BERANEK & NEW	3- 11	7 3/8	- 7/8	-10.6
N	BUNKER-RAMO	6- 14	9	- 1/2	-5.2
A	CALCOMP	11- 33	32 1/4	+5 7/8	+22.2
O	COGNITRONICS	3- 13	6 3/4	-1 3/4	-20.5
O	COLORADO INSTRUMENTS	4- 13	6 1/4	-1 1/4	-16.6
O	COMPUTER COMMUN.	5- 36	7 3/4	-1 3/4	-18.4
A	COMPUTER EQUIPMENT	4- 12	4 1/4	- 1/2	-10.5
A	COMPUTEST	14- 28	15	-1 3/8	-8.3
A	DATA PRODUCTS CORP	5- 26	6 3/4	-1 1/4	-15.6
O	DATA TECHNOLOGY	4- 23	3 3/4	- 1/2	-11.7
O	DIGITRONICS	4- 13	4 1/2	0	0.0
N	ELECTRONIC M & M	7- 40	9 3/4	+ 5/8	+6.8
O	FABRI-TEK	3- 8	3	- 1/2	-14.2
O	FARRINGTON MFG	2- 17	2 3/4	- 1/8	-4.3
O	INFORMATION DISPLAYS	4- 20	7 3/4	+ 1/4	+3.3
A	MARSHALL INDUSTRIES	14- 67	25 3/4	+ 3/8	+1.4
A	MILGO ELECTRONICS	15- 42	32 7/8	+ 7/8	+2.7
N	MOHAWK DATA SCI	19- 87	30 1/2	-1 5/8	-5.0
O	OPTICAL SCANNING	11- 52	17 1/2	+ 1/2	+2.9
O	PHOTON	4- 17	8 1/2	- 1/2	-5.5
O	PHOTO-MAGNETIC SYS.	1- 9	1 1/4	- 1/8	-9.0
A	POTTER INSTRUMENT	15- 42	21 1/2	+ 1/8	+0.5
O	PRECISION INST.	6- 25	8 1/2	- 1/2	-5.5
O	RECOGNITION EQUIP	13- 83	16	-1	-5.8
O	REDCOR CORP.	4- 34	5 3/8	0	0.0
N	SANDERS ASSOCIATES	7- 29	12 3/8	-1 1/4	-9.1
O	SCAN DATA	5- 53	5 1/4	- 5/8	-10.6
O	TALLY CORP.	10- 23	15 1/2	- 1/4	-1.5
N	TELEX	10- 25	22 1/2	+ 5/8	+2.8
O	VIATRON	2- 51	3 5/8	- 5/8	-14.7
	SUPPLIES & ACCESSORIES				
N	ADAMS-MILLIS CORP	8- 15	12 3/4	- 1/2	-3.7
O	BALTIMORE BUS FORMS	7- 21	7	- 1/2	-6.6
A	BARRY WRIGHT	6- 25	8 1/4	- 5/8	-7.0
A	DATA DOCUMENTS	15- 35	17 1/2	- 5/8	-3.4
N	ENNIS BUS. FORMS	11- 19	11 1/2	+ 3/4	+6.9
O	GRAHAM MAGNETICS	5- 10	9 3/4	0	0.0
O	GRAPHIC CONTROLS	7- 17	7 1/4	- 1/2	-6.4
N	MEMOREX	46-166	80 1/8	+ 7/8	+1.1
N	3M COMPANY	71-114	88 1/8	-1	-1.1
O	MOORE BUS. FORMS	27- 38	33	- 3/4	-2.2
N	NASHUA CORP	21- 43	27 1/4	-1 3/4	-6.0
O	REYNOLDS & REYNOLD	25- 48	36	- 1/4	-0.6
O	STANDARD REGISTER	17- 30	16 3/4	-1 1/4	-6.9
N	UARCO	22- 39	24 1/2	-1 1/8	-4.3
A	WABASH MAGNETICS	7- 30	9 3/8	- 1/2	-5.0
O	WALLACE BUS FORMS	25- 41	35 3/4	- 3/4	-2.0
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	78-173	113 1/2	+1 1/8	+1.0
N	COLLINS RADIO	9- 37	15	- 7/8	-5.5
N	CONTROL DATA CORP	30-122	46	+1 1/2	+3.3
A	DIGITAL EQUIPMENT	50-124	59 1/2	-7 1/4	-10.8
N	ELECTRONIC ASSOC.	3- 11	4 5/8	0	0.0
A	ELECTRONIC ENGINEER.	3- 14	4 7/8	+ 1/4	+5.4
N	FOXBORO	18- 39	21 1/2	-2	-8.5
O	GENERAL AUTOMATION	9- 42	12 3/4	- 1/4	-1.9
N	GENERAL ELECTRIC	60- 86	85 7/8	+ 3/4	+0.8
N	HEWLETT-PACKARD CO	19- 45	26 5/8	- 5/8	-2.2
N	HONEYWELL INC	65-152	76 5/8	-1 7/8	-2.3
N	IBM	223-387	298 1/2	+10 1/2	+3.6
N	NCR	30- 86	35 3/4	-1 3/4	-4.6
N	RCA	18- 34	22 3/4	-1	-4.2
N	RAYTHEON CO	16- 33	21 1/8	- 1/4	-1.1
O	SCI. CONTROL CORP.	1- 8	1 3/4	- 3/8	-17.6
N	SPERRY RAND	19- 40	23 1/4	-1	-4.1
A	SYSTEMS ENG. LABS	10- 49	18 1/2	+ 1/4	+1.3
N	VARIAN ASSOCIATES	9- 29	13 1/8	-1	-7.0
A	WANG LABS.	18- 51	34 3/8	+1 3/8	+4.1
N	XEROX CORP	66-115	86 7/8	+1 7/8	+2.2
	LEASING COMPANIES				
O	BOOTHE COMPUTER	8- 25	12 1/4	- 3/4	-5.7
O	BRESNAHAN COMP.	3- 9	2 7/8	- 1/8	-4.1
O	COMPUTER EXCHANGE	2- 8	5 1/4	0	0.0
O	COMPUTER LEASING	3- 18	3	0	0.0
N	DATA PROC. F & G	6- 32	12 3/4	- 1/4	-1.9
O	DATRONIC RENTAL	2- 8	3 1/2	- 1/4	-6.6
A	DEARBORN COMPUTER	10- 24	19 3/8	+ 1/4	+1.3
O	DIEBOLD COMP. LEAS.	2- 8	3 1/4	- 1/2	-13.3
A	DPA, INC.	3- 10	4 5/8	- 1/4	-5.1
A	GRANITE MGT	7- 22	10 3/8	- 1/4	-2.3
A	GREYHOUND COMPUTER	5- 44	6 3/4	- 3/4	-10.0
N	LEASCO DATA PROC.	7- 30	12 1/4	- 1/8	-1.0
O	LECTRO COMP LEAS	2- 9	2 3/4	- 1/4	-8.3
A	LEVIN-TOWNSEND CMP	3- 19	5 5/8	- 1/4	-4.2
O	LHC DATA, INC.	1- 3	1 1/2	0	0.0
O	MANAGEMENT ASSIST	1- 4	1 1/8	- 1/4	-18.1
O	NCC INDUSTRIES	3- 8	4 1/4	- 1/4	-5.5
O	SYSTEMS CAPITAL	1- 8	2 7/8	- 1/8	-4.1
N	U.S. LEASING	3- 19	13 3/4	0	0.0

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

Earnings Reports

CTC COMPUTER CORP.
Six Months Ended June 30

	1970	1969
Revenue	$2,936,004	$1,109,494
Loss	912,181	389,541

VIATRON COMPUTER SYSTEMS
Three Months Ended July 31

	1970	1969
Revenue	$616,000	$223,000
Loss	a8,117,000	2,617,000
9 Mo Rev	1,582,000	471,000
Loss	15,429,000	4,969,000

a-Includes about $2 million in costs that had been capitalized in the six months ended April 30.

ADAMS-MILLIS CORP.
Nine Months Ended Sept. 30

	1970	a1969
Shr Ernd	b$.93	$.70
Revenue	40,346,060	32,895,506
Spec Chg	d200,000	.....
Earnings	c1,600,188	1,320,244

a-Restated to include results of Macon Machine Co., acquired in February, 1970, on a pooling-of-interests basis. b-Based on income before special charge. c-Equal to 83 cents a share. d-Results from the difference between the book value of MAC Panel Co. assets and the recorded value of Certron Corp. common stock received therefore on Oct. 22, 1970.

INFORMATICS INC.
Six Months Ended Sept. 26

	1970	1969
Shr Ernd	$.08	.....
Revenue	9,374,000	$9,003,000
Earnings (Loss)	120,000	(170,000)

COMPUTER SCIENCES CORP.
13 Weeks Ended Sept. 25

	1970	a1969
Shr Ernd	$.10	$.22
Revenue	26,073,000	25,970,000
Earnings	1,235,000	2,854,000
26 Wk Shr	.20	.45
Revenue	52,783,000	48,863,000
Earnings	2,519,000	5,698,000

a-Restated.

OPTICAL SCANNING CORP.
Year Ended June 30

	1970	a1969
bShr Ernd	$.35	.....
Revenue	10,261,907	$7,999,188
Earnings (Loss)	189,743	(191,938)
Spec Cred Earnings (Loss)	e236,743	(191,938)

a-Restated to reflect acquisition of Precision Business Forms division in April, 1970. b-Based on income before special credit. c-Tax carryforward. e-Equal to 43 cents a share.

ELECTRONIC MEMORIES & MAG.
Three Months Ended Sept. 26

	1970	a1969
Shr Ernd	.....	b$.21
Revenue	$23,630,000	23,231,000
Earnings (Loss)	(795,000)	1,316,000
9 Mo Shr	c.....	b.67
Revenue	71,366,000	67,411,000
Earnings	772,000	4,155,000

a-Restated to reflect acquisitions on a pooling-of-interests basis. b-Adjusted to reflect two-for-one stock split in December 1969. c-No common share earnings calculated; preferred dividend requirements exceeded net income.

HONEYWELL INC.
Three Months Ended Sept. 30

	1970 (000)	1969 (000)
Shr Ernd	$.71	$.90
Revenue	345,500	338,400
Earnings	11,400	13,700
9 Mo Shr	2.57	2.65
Revenue	1,091,600	1,009,800
Earnings	40,300	39,800

AMERICAN USED COMPUTER CORP
FOR SALE
HON 200 series
50+% off
MOST MODELS AND CONFIGURATIONS
WE TRADE ALL SYSTEMS
Call 617 227-8634
15 School St., Boston, Mass.
a BOSTON COMPUTER GROUP company

MetaCOBOL™.

A return to the simple life.

A life without the limitations of COBOL...but without having to learn a new language. Because MetaCOBOL and COBOL are compatible.

MetaCOBOL has a unique macro statement facility. You can define new verbs, simplify writing multi-part verbs, eliminate writing extensive data name qualifications, abbreviate existing COBOL words and phrases. You can develop your own macro statements embedded in COBOL programs. And your output is always in standard COBOL format!

MetaCOBOL will also permit a user to define a library of standard macros and abbreviations. It will produce report writing, information retrieval and other generalized programs from simple parameters.

MetaCOBOL also helps in debugging. It will generate test data and supply output in source language form.

And it's operational!

Call ADR today. Write in MetaCOBOL tomorrow.

APPLIED DATA RESEARCH
THE SOFTWARE BUILDERS
CREATORS OF AUTOFLOW, METACOBOL, LIBRARIAN, SAM, ROSCOE, IAM, STAR AND PI SORT.

Call your nearest ADR office:
Atlanta 404-233-3087/Boston 617-246-0167/Chicago 312-692-7153/Cincinnati 513-531-3060/Cleveland 216-331-1608/Dallas 214-638-3890/Detroit 313-875-5721/Hartford 203-643-1597/Houston 713-526-3188/Kansas City 816-753-5372/Los Angeles 213-826-5527/Miami 305-751-8551/ Milwaukee 414-964-7720/Minneapolis 612-333-6050/New York 212-986-4050/Philadelphia 215-835-2088/Pittsburgh 412-391-3439/Rochester/716-442-0420/San Francisco 415-981-4740/San Juan 809-725-0264/Seattle 206-682-3244/St. Louis 314-862-2120/Washington 703-524-9880. *Foreign Cities:* Amsterdam 020-76-38-98/Bruselles 11-94-70/Dusseldorf 0211-32-34-71/Geneve 41-22-43-93-60/Johannesburg 42-8212/London 01-242-0021/Milano 86-08-07/Oslo 41-51-79/Paris 533-57-20/Stockholm 60-86-11/Tokyo 742-1291.

Applied Data Research, Inc./Route 206 Center/Princeton, New Jersey 08540/Telephone: 609-921-8550